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sodium mineral development

environmental assessment

final

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bureau of land management
rock springs district
rock springs, wyoming

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WY-049-EA81-8

DECISION RECORD

I. Title of Proposal: Sodium Mineral Development in the Rock Springs District, Wyoming.

The proposed actions include the sodium management recommendations in the Big Sandy, Salt Wells, and Pioneer Trails Management Framework Plans. The proposed management decisions are to:

A. Issue new competitive leases within the Known Sodium Leasing Area (KSLA), as defined by the U.S. Geological Survey (now known as the Minerals Management Service), within the context of the planning objectives. The objectives are: (1) to make sodium minerals available in an orderly and timely manner as to meet national and export needs; (2) to promote healthy competition within the industry; and (3) to assure a fair return to the public.

B. Issue prospecting permits outside the trona deposition area, except for the contingency listed in Item I-C below. Prospecting permit applications for the area between the KSLA and the deposition area would not be granted. The trona deposition area is defined as the geologic basin which includes the KSLA. The issuance of a prospecting permit could initiate a preference right leasing (noncompetitive) process; issuance of such a lease would be contingent upon the permittee's discovery of a valuable sodium mineral deposit as defined in 43 Code of Federal Regulations 3500.0-5. The Minerals Management Service is responsible for evaluating and determining the validity of such a discovery.

C. If pending preference right lease applications in the sodium carbonate brine area are approved, the Bureau of Land Management (BLM) would request that the Minerals Management Service designate the area as a KSLA for competitive leasing. If the applications are not approved, the area would remain open to prospecting and pending prospecting permits would be issued. The sodium carbonate brine area is defined as T. 23, 24, and 25 N., R. 106 W., and T. 23 and 24 N., R. 107 W.

D. The following limited surface occupancy criteria would be applied on a case-by-case basis to all new leases, lease renewals, and development proposals within the areas identified by the Bureau's planning documents and accompanying maps. The criteria would be applied at the discretion of the BLM Authorized Officer (AO) in considering the cost/benefit analyses and other siting constraints or opportunities that may exist within the specific area. The Bureau's planning analysis indicates that developments such as hoist houses, processing plants, steam plants, ore and coal stockpiles, loadout

facilities, storage tanks, office/storage buildings, tailings ponds, and containment areas usually would not meet the criteria.

1. Limit surface occupancy within one-fourth mile of any identified sage grouse strutting grounds and no disturbance within an additional one-fourth mile of sage grouse lek center during the March 1-May 15 breeding season unless authorized by the AO.

2. Limit surface occupancy within one-fourth mile of either side of various historic trails and sites of the area for the purpose of protecting these historical values.

3. Limit surface occupancy within one-half mile of either side of the Flaming Gorge Reservoir and the Green, Blacks Fork, and Hams Fork Rivers for the purpose of protecting water quality. Variations (greater or less than one-half mile) may be required depending on the nature of contaminant control.

4. Limit surface occupancy in those areas visible within the foreground-middleground (see definition in EA) from the Flaming Gorge Reservoir operating pool (6,040 feet above MSL), for the purpose of protecting visual and recreation values of the National Recreation Area (NRA). This means that developments which have intrinsically little visual impact may be approved, but structures which would have significant visual impact would usually be excluded. The key principle is whether the structure or development would dominate the foreground-middleground. This is consistent with the Forest Service's "partial retention" policy for the NRA. Within the partial retention zone, a small pump house structure with ancillary road and powerlines would be acceptable because it does not dominate the landscape or skyline.

5. No surface occupancy and surface-disturbing activities that would impair wilderness characteristics would be allowed (refer to "Interim Management Policy and Guidelines for Lands Under Wilderness Review," issued by the U.S. Department of the Interior, BLM, December 12, 1979, and "Wilderness Management Policy", Department of the Interior, BLM, September 1981).

6. Limit locations of plant facilities that would significantly degrade air quality over the Flaming Gorge NRA: or cause heavy fog conditions taht would be significant hazards to public health, such as black icing of major highways, or such as extreme and continual fog that could inhibit transportation or recreation activities.

7. Limit surface occupancy and season of use in big game crucial wintering habitat for the purpose of protecting deer and antelope populations within the KSLA. As mitigation of unavoidable impacts of development, the BLM Authorized Officer (AO) will consider the possibility of enhancement of habitat on a case-by-case basis. Possible habitat manipulation activity could include seeding, prescribed burning, guzzler/water developments, plantings, etc.

8. Limit surface occupancy and season of use in certain lambing and high-value livestock grazing areas. In cases where loss of such habitat areas is unavoidable, enhancement projects such as listed in No. 7 above will be considered by the AO.

9. Limit surface occupancy in the White Mountain Wild Horse Management Area that would visually interfere with the special viewing turnout to be established along Highway 191.

E. The following prospecting permit stipulations have been proposed; they would be attached to permits involving sodium mineral exploration in the District.

1. The permittee shall avoid any operation when the ground is muddy and/or wet. The BLM Authorized Officer (AO) may prohibit exploration, drilling, or other activities during wet or heavy snow periods.

2. Whenever possible, a portable mud pit shall be used when drilling with fluids. Where this is not possible, the pit shall be rehabilitated to eliminate the hazard to livestock and wildlife (fence or solidly filled).

3. No blading or other dirt work will be allowed without written permission from the AO. Use of existing roads and trails will be permitted as long as no dirt work is required.

4. Garbage and/or trash will not be buried in most instances. All trash and garbage must be stored in an approved container/cage, and hauled to an approved disposal site.

5. Access across public lands to the permit area will require authorization through the issuance of a Temporary Use Permit (TUP) or Right-of-Way (ROW).

6. Any vegetation removed during blading or construction shall be spread over the disturbed area after seeding as cover for the seeded area.

7. At least six inches of topsoil or available soil material shall be stockpiled to be spread over disturbed areas after completion of operations, unless otherwise specified by the AO.

8. Prior approval from the AO is needed for the use of water from developed stock or wildlife water sources on public lands.

9. All prospecting activities including, but not limited to, drilling operations, water hauling, various vehicular traffic, etc., shall be restricted to the permitted area and/or the area authorized in the TUP or ROW.

10. All areas disturbed will be rehabilitated to the satisfaction of the AO.

11. A cultural resource inventory will be conducted, pursuant to Executive Order 11593 and BLM Instruction Memorandum WY-80-523, before any surface-disturbing activity is allowed. The inventory will identify all cultural resources present within each proposed permit area, and will be conducted at the company's expense.

    If National Register quality sites are found during the cultural resources inventory, Section 106 compliance procedures shall be conducted and appropriate mitigation shall be applied. Salvaging and testing of non-Federal register sites shall be conducted pending the approval of the BLM AO.

12. Drill Hole Plugging Standards: All drill holes will be plugged in accordance with the State of Wyoming Land Quality Rules and Regulations, and in particular W.S. 35-11-404.

13. No activity shall take place in big game crucial winter habitat between November 15 and March 15 without prior approval of the appropriate AO.

14. In order to protect sage grouse strutting and nesting habitat, no surface disturbance will be allowed within two miles of any sage grouse lek center strutting ground between March 1 and June 15. No major surface disturbing activity will be allowed within one-fourth mile of an established lek center.

15. No surface-disturbing activities will be allowed in identified lambing areas between May 1 and June 10 unless authorized by the BLM AO.

16. The BLM, Minerals Management Service, and State Engineer's Office shall be notified if black water or flowing artesian wells are encountered during drilling operations.

17. Surface disturbance will not be allowed within one-fourth mile of any well-preserved ruts of the various historic trails.

18. Any prospecting within a wilderness area or wilderness study area will comply with all laws, regulations, and interim management policy applicable to the protection of the wilderness characteristics of the area.

19. All drainages will be kept open so as to allow free water movement.

20. After operations are completed, any new roads or pads constructed will be rehabilitated. All berms and borrow ditches shall be smoothed to conform to the surrounding terrain.

21. All existing roads that are to be used shall only be graded to prevent rutting and to fill in ruts. Any additional blading or widening of existing access roads will be allowed only with the permission of the AO.

22. Road drainage crossings shall be designed so they will not cause siltation or accumulation of debris in the drainage crossing nor shall the drainages be blocked by the road bed. Whenever possible, streambank crossings on major drainages should be constructed with the bank feathered back on a 45° horizontal angle or less to avoid siltation.

23. Prospecting activity will not be allowed within one mile of identified raptor nests during the nesting period of March 1 to June 30. In addition, golden eagle nest sites should not be disturbed any time during the year.

II. Alternatives Considered

A. No Action- The Bureau would not exercise discretionary actions such as competitive leasing, allowing prospecting, renewing leases, or issuing rights-of-way (ROW) necessary for sodium mineral development.

B. No Competitive Leasing- The Bureau would deny all competitive lease applications, and would not nominate selected tracts for leasing. Prospecting permits and subsequent noncompetitive lease applications outside the trona deposition area would be processed, with the possible exception that the sodium carbonate brine area could become a KSLA and thus not part of the permitted prospecting area.

C. No Prospecting- The Bureau would not issue prospecting permits and all pending prospecting permit applications in the Rock Springs District would be denied. New competitive leases within the KSLA would be issued in the context of the planning objectives.

D. Unlimited Prospecting- All pending and future prospecting permits outside the KSLA would be processed under applicable regulations. This would include the area within the trona deposition area but outside the KSLA. Subsequent noncompetitive lease applications would be processed.

III. Decision and Rationale

A. Decision- The Proposed Action and Committed Mitigation identified in Section I above, and the mitigation and monitoring described in Parts C and D below, are accepted. The Bureau will prepare within 30 days of this decision an Activity Plan to implement the elements of the decision, including provisions for site-specific assessments as deemed necessary to meet the provisions of 43 Code of Federal Regulations 3500.

B. Rationale- Bureau analysis indicates that Federal actions as mitigated will meet national and export needs for southwestern Wyoming sodium minerals without causing undue damage to the environment. Potential environmental damage due to mine and plant development will require site-specific analysis and mitigation. Nevertheless, judicious application of the limited surface occupancy criteria will ensure that other resources and resource values are not unduly affected by developments allowed under this decision. The Wyoming Industrial Siting Act and State environmental quality standards are further assurances that development will proceed in an orderly manner.

Prospecting permits within the trona deposition area but outside the KSLA are rejected because there is little likelihood that the area contains economic deposits of sodium as defined by the Minerals Management Service in its 1978 criteria for the KSLA. By that definition, all deposits in the trona deposition area that could be commercially mined using current methods are within the KSLA.

Sodium mineral development in Sweetwater County has been a major source of jobs, tax revenues, and business for many years. The wealth of the trona deposits promises that the industry will continue to play a major role in the lives of southwestern Wyoming residents

for many more decades. The Bureau believes that sound development of Federal minerals in accordance with the planning objectives will contribute the continued well-being of area residents.

C. Mitigation- Public comment on the planning recommendations and environmental assessment of sodium mineral development were given due consideration prior to acceptance of the following mitigating measures. Some overlap of State and Federal mitigation may be noted; nevertheless, the Bureau adopts these measures in the spirit of cooperation with other agencies in protecting the area's resources and resource values. However, no dual enforcement is intended; the State of Wyoming will enforce that mitigation covered under State rules and regulations.

The limited surface occupancy and stipulations for prospecting permits apply in cases of surface-disturbing activities. Also approved are the following mitigating measures:

1. Watering or other approved dust control methods will be required during the construction of plant sites, rights-of-way, tailings ponds, and during rehabilitation operations when dust and resulting air pollution exceeds standards set by the Wyoming DEQ.

2. A soil binder should be spread on the dry exposed surfaces to control blowing dust from dry portions of the tailings and containment pond areas especially during the summer months.

3. Use of temporary or non-paved road surfaces during heavy vehicular traffic periods will be water sprayed or covered with a dust binding agent to reduce dust and reduce visual impacts.

4. Soil stockpiles from tailings ponds and plant sites with wind erodibility potential should be graded on all sides to a maximum slope of 4:1 before being revegetated. These stockpiles will be seeded as soon as possible to provide soil stabilization. Other wind erosion precautions such as snow fences, mulching, mixing of topsoils, or covering stockpiles with soils of low wind erosion properties will be done where deemed necessary.

5. Stockpiles of trona and coal will be located either near natural or manmade windbreaks.

6. Permanent access roads to plant sites, mine shafts, parking lots, etc., will be paved to eliminate dust from vehicular movement.

7. No road, pipeline, buried cable, or other major surface disturbing activity will be allowed on slopes greater than 20% unless the Authorized Officer (AO) makes exception.

8. Existing sand and gravel pits will be utilized whenever the AO determines it feasible, before new sites are to be excavated.

9. If paleontological resources are discovered in the course of construction or excavation, the activity will cease and the BLM AO notified. The company will provide a qualified individual approved by the BLM to collect and remove the fossils.

10. All disturbed areas will be recontoured to blend with the natural topography, topsoiled, and seeded as soon as possible after construction.

11. Upon abandonment of plant and mine sites, reclamation as listed in No. 10 above will commence immediately.

12. Site grading will be carried out only where absolutely required, as determined by the AO. Topsoil stockpiling should be done for all suitable soils as determined by the authorized officer.

13. Construction of roads with frozen earth material mixed with snow and ice shall not be allowed, unless permitted by the AO.

14. Loading facilities and associated transportation routes will be periodically cleared of debris.

15. Coarse-textured soils are recommended for plant and tailings ponds locations.

16. All solid waste (trash and garbage) material generated during construction and operation will be collected and disposed of in an authorized sanitary landfill.

17. All embankment fill material for reservoir dams should come from within the reservoir areas. Borrow pits will not be required unless special materials are necessary, such as clay for filling a core trench. If a separate fill area is utilized, after the fill is removed the area will be stabilized.

18. A soil conservation plan tailored to each mine site shall be developed and approved by the BLM AO prior to construction. The soil conservation plan will include:

a. Identify on map of area

Surface disturbance during construction
Location of topsoil and amount
Sources and amount of fill material
Soil test sites for monitoring
Potential soil erosion areas

b. Soil erosion control methods with potential site locations as identified on map of area
Revegetation of disturbed areas

Methods
Materials
Time frames

d. Soil fertility program to meet revegetation needs of disturbed areas

19. Waterbars will be installed on disturbed and rehabilitated areas to prevent erosion. General guidelines for installation of waterbreaks are: less than 2% grade, 200-foot interval; 2-4% grade, 100-foot interval; 4-5% grade, 75-foot interval; greater than 5% grade, 50-foot inverval. A certain degree of latitude is allowed in the waterbreak interval spacing. Unstable soils may require a closer interval spacing, whereas the interval spacing may be greater on very stable soils or rock outcroppings. A conservative (close) interval spacing is the general recommendation. Waterbreaks are generally constructed on the contour and empty on the downhill side of the cleared area. They are to be constructed to begin in vegetation on the uphill side and feather out into vegetation on the downhill side.

20. Vegetation or soil that has been removed will not block drainages.

21. Centerline survey and construction designs requested by the BLM AO will be approved by the AO prior to road construction.

22. Pipeline trenches should be maintained in order to correct settlement and erosion. The soil placed in pipeline trenches will be compacted during backfilling. All pipelines will be buried where they cross existing roads.

23. Topsoil or soil material will be stripped from permanent access roads and railroad routes, and redistributed along the cuts and fills and backslopes. Those areas will be seeded.

24. Soils contaminated by accidental or operational spills should be reclaimed through removal and disposal at an authorized dump site.

25. State and Federal regulations currently in existence which provide measures designed to protect water quality will be strictly adhered to in any sodium mineral development.

26. Discharge of water on public lands will not be permitted without permits from DEQ and authorization from the Minerals Management Service and the BLM.

27. Use of existing roads to streams, rivers, or reservoirs will be used whenever possible to minimize disturbance, channelization or runoff and thus protecting water quality.

28. Plant site will be designed for "zero discharge concept" through the use of containment ponds.

29. Emergency containment ponds will be in place below tailings and containment ponds.

30. Water-bearing formations with sufficient quality and potential for beneficial use will be protected.

31. The lessee will demonstrate that the proposed tailings pond area would be impervious to seepage of tailings, containment, sewage, etc., ponds.

32. Tailings ponds will be designed to withstand two consecutive 100-year floods. This includes the use of diversion canals or ditches to intercept natural runoff and divert drainages below tailings pond area.

33. A contingency plan for tailings ponds failure will be prepared for BLM and DEQ approval.

34. During shaft sinking, any ground water encountered will be grouted off and sealed.

35. A premining plan that addresses the hydraulic characteristic of aquifers that may be affected by mining, determine the quantity and quality of ground water to be dewatered at various stages of mining, evaluate impacts of the quantity and quality of adjacent water resources, and water rights due to mining activities or dewatering will be submitted to the BLM.

36. Proper size culverts with appropriate energy dissipation devices as necessary (able to handle at least a 10-year flood event) will be installed at

each drainage crossing with a watershed area greater than 10 square miles. A 10 square mile area is capable of causing substantial erosion and washout of the drainage crossing if improperly designed or constructed. Designing culverts capable of handling a 10-year flood event will generally assure that the culvert installed will be capable of handling the volume of flow without being washed out. This size storm event could likely occur at least once during the life of an access road. The company will submit for BLM's approval the culvert size and dissipation device design prior to installation.

37. The company or its operator will indicate in their development plans locations of drainage crossings along with the type of structure (culvert, arch bridge, etc.) proposed to be approved by the BLM.

38. Temporary stream stability structures (e.g., gabions, weirs, etc.) will be required on a case-by-case basis where access roads cross stream channels or parallel steep cutbanks and fill slopes for silt retention. Cribbing or retaining structures on constructed slopes in unstable soil steeper than 2 to 1 may also be required unless otherwise authorized by the BLM.

39. Any plant, mill, tailings pond, and sewage lagoon will be at least one mile from a perennial water body.

40. All disturbed areas not to be utilized will be rehabilitated to the satisfaction and specifications of the AO.

41. Threatened and endangered plant species (T&E) clearances are necessary for all areas of surface disturbance.

42. Clearing of vegetation within pipeline, powerline, and communication line ROW will be limited to that area absolutely necessary for safe operation of equipment and to permit construction activities.

43. Construction of roads, pipelines, powerlines, and communication lines will be restricted between the general period of November 15 and March 1 as determined by the AO, depending on weather and soil moisture conditions to minimize total vegetation destruction and soil disturbance.

44. Tailings ponds reclamation experiments should be continued.

45. The following seeding stipulation will be utilized. The operator is responsible for establishing an acceptable

stand of vegetation. The seed mix will be based on pure live seed.

Seed is to be planted after September 1 and prior to ground frost; or seed will be planted after the frost has left and before May 15. Fall seeding is best. All seed must be drilled on the contour at a depth of 1/4 to 1/2 inch. Slopes too steep or rocky for machinery can be broadcast and the seed hand raked into the soil. When broadcasting the seed, the rate per acre should be doubled.

If operations are completed in the spring, the rehabilitated areas will be seeded with 15 lbs/acre oats and/or barley. The following fall the area will then be mowed and interseeded with the above seed mixture.

46. Threatened and endangered wildlife species clearance on public lands will be required before any surface disturbing activities.

This will generally include a survey conducted by the BLM to determine if a "may affect" situation exists. If so, Section 7 consultation (Endangered Species Act) will be initiated with the U.S. Fish and Wildlife Service.

47. All prairie dog towns that would be affected by construction activities must be surveyed for black-footed ferrets per BLM Rock Springs District Office Instruction Memorandum WY-04-80-59 dated September 19, 1980. Destruction of prairie dog towns should be avoided.

48. No construction activity will be allowed within one mile of the identified raptor nests during raptor nesting period of March 1 through June 30. In addition, golden eagle nest sites will not be disturbed any time during the year.

49. Habitat improvement projects will be required as specified by BLM to offset the loss of big game crucial winter habitat that would be taken out of production for long periods. Types of projects that will be considered on a case-by-case basis are plowing and seeding, prescribed burning, guzzlers, water developments, etc.

50. All areas that would pose hazards to wildlife species will be fenced. Such areas include plant site, tailings ponds, containment ponds, primary and secondary sewage lagoons, etc. Fencing standards will be approved by the BLM.

51. The most recognized method(s) of hazing, harassing, or distracting the birds will be employed to diminish the possibility of migratory waterfowl use of tailings ponds. Records will be kept on the disposition of all wildlife involved in tailings ponds incidents and submitted to the Fish and Wildlife Service.

52. Tailings ponds will be patrolled, and migratory birds that do use the tailings ponds and are rendered flightless will be rehabilitated and released through the use of halfway houses.

53. Major surface-disturbing activities will not take place within one-fourth mile of any established sage grouse strutting grounds (lek center). Surface disturbance within an additional 1 3/4 miles of the lek center will not be allowed during the period of March 1 to June 15 unless authorized by the AO.

54. Water should be taken from the Green River at or as close to the Flaming Gorge as possible to maintain water levels for fisheries.

55. Funding support for the Wyoming Game and Fish Department, for instream boulder placements to improve trout cover during low flow periods, will be considered.

56. A cultural inventory will be required prior to any surface disturbance.

57. Prior clearance must be given when previously identified cultural site areas are to be entered.

58. Alluvium deposit areas will be monitored by the archeologist during the actual surface disturbance if required by the AO.

59. A one-fourth mile buffer zone will be maintained around all identified sites unless authorization is received from the AO.

60. Crossing of historic trails will be limited to areas where trails are not well defined, as determined by the AO.. Trails are to be crossed in a perpendicular fashion, and no paralleling within one-fourth mile of trail will be allowed.

61. At the discretion of the AO visible structures will be painted with natural colors to blend with the landscape (pump houses on water lines, storage tanks etc.). Appropriate colors will be selected by the AO.

62. All development (roads, drill pads, etc.) must be consistent with each area's existing visual contrast rating classification. Development which would exceed the visual contrast rating classification must be either modified or the area will be reclaimed to be consistent with the visual classification.

63. Developments will be designed to meet VRM Class standards. Selected removal of juniper and other timber types and avoidance of regular patterns in development will be utilized to reduce the visual impact.

64. Ancillary facilities such as roads, powerlines, and pipelines should follow existing corridors of disturbance whenever practicable.

65. Range improvement projects in the area will be required as specified by the BLM to offset the loss of prime livestock grazing range, that would be taken out of production for long periods.

D. Monitoring- Soda ash "fallout" has been and will continue to be monitored. Further information is needed to assess the impacts and determine the necessary, if any, mitigation. The monitoring system will be designed and implemented by an interdisciplinary staff including, but not limited to, a botanist, hydrologist, and soil scientist as part of the Bureau's Activity Plan for Sodium Mineral Development. The basic study requirements listed in the EA (pages 123-124 of Volume 1) will be considered in designing the system.

IV. Conclusions

Based on the analysis in the programmatic environmental assessment, I conclude that this action will result in no significant impacts to the environment and, therefore, conclude that no EIS is necessary. Plant/mine developments that could occur as a result of this action will be addressed, however, in site-specific analyses on a case-by-case basis.

Kemmerer Resource Area Manager — 5/24/82 Date

Big Sandy Resource Area Manager — 5/20/82 Date

Robert W. Bueren
Salt Wells Resource Area Manager — 5/20/82 Date

I Concur:

Rock Springs District Manager — 5/24/82 Date

DEPARTMENT OF THE INTERIOR

FINAL ENVIRONMENTAL ASSESSMENT

OF

SODIUM MINERAL DEVELOPMENT

IN

ROCK SPRINGS DISTRICT, WYOMING

Located in the Counties of Sweetwater, Uinta, Lincoln, and Sublette, Wyoming

BUREAU OF LAND MANAGEMENT

ROCK SPRINGS DISTRICT, WYOMING

WY-049-EA81-8

MAY 1982

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PREFACE

The Final Environmental Assessment (EA) on the regional development of sodium minerals in the Bureau of Land Management's Rock Springs District, Wyoming, consists of two volumes. Volume 1 was printed and distributed in August 1981 as the Draft Environmental Assessment of Sodium Mineral Development in Rock Springs District, Wyoming. Comments received on that volume did not require major changes in the data, analysis or conclusions. Thus, Volume 1 has not been reprinted. Persons who received Volume 1 were encouraged to retain that volume (page 129). A limited number of copies of Volume 1 are available upon request from the Sodium EA Team Leader, Bureau of Land Management, P.O. Box 1869, Rock Springs, Wyoming.

Volume 2 is titled the Final Environmental Assessment of Sodium Mineral Development in Rock Springs District, Wyoming. This volume contains revisions of Volume 1 in response to public comments and further analysis by the Bureau's EA team. It also contains responses to all substantive comments whether a change was necessary or not. A summary of Volume 1 is included in this volume; however, Chapters 1 through 3 and the appended material of Volume 1 are incorporated into the Final Environmental Assessment by reference.

The Bureau reminds the reader that the scenarios presented in this EA do not represent BLM projections of actual sodium development; they are intended as an approach to the impacts of sodium mineral development, especially in regard to the potential influence of Bureau actions. Sodium mineral development has been considered through the Bureau's planning system for the Big Sandy, Kemmerer, and Salt Wells resource areas; in addition, BLM has many prospecting permit applications, competitive lease applications, and existing leases with pending renewal reviews yet to be considered.

SUMMARY

This section briefly discusses information found in the Draft Environmental Assessment of Sodium Mineral Development in the Rock Springs District, which constitutes Volume 1 of this environmental assessment (EA). The reader is referred to that volume for details; nevertheless, certain key tables have been repeated in this volume.

The focus of this EA is the trona deposition area and the sodium carbonate brine area of Southwest Wyoming (Map 1); although the entire District is analyzed for sodium mineral development, especially in terms of prospecting.

AREA OF ANALYSIS

The sodium development area, defined as the trona deposition and the sodium carbonate brine area, lies within the Green River Basin; which is underlain by the Wasatch, Green River, and Bridger geologic formations.

The trona deposition area encompasses approximately 914,560 acres of Federal, State, and private lands in Sweetwater and Uinta Counties, Wyoming. Approximately 75 percent of that area is within the "checkerboard," a land ownership pattern in which sections of public land (Federal) alternate with sections of private or State owned lands. The remaining 25 percent of the area is mostly solid-block public land managed by the Bureau of Land Management (BLM)), U.S. Fish and Wildlife Service (FWS), and U.S. Forest Service (FS) with scattered sections owned and managed by the State of Wyoming or private landowners. The trona deposition area includes the Known Sodium Leasing Area, or KSLA (see Glossary).

The trona deposits in Southwest Wyoming are the largest known commercial source of natural soda ash, or anhydrous sodium carbonate, in the world (Culbertson 1966; Innes 1980). Total Southwest Wyoming deposits are estimated at 134 billion tons (Culbertson and Burnside 1979), as shown in Table II-4, Chapter II Revisions, Volume 2. Approximately 1.8 tons of trona are required to produce a ton of soda ash.

The sodium carbonate brine area is approximately 114,000 acres of Federal, State, and private lands in Sweetwater County. The "black trona water" has been encountered during the drilling of numerous wells in the Eden-Farson area.

Sodium mineral development is a relatively new, but important, industry in the Rock Springs District. The markets for Wyoming soda ash are extensive, and the Wyoming production is a major world source of soda ash (Figure I-2, page 5, Volume 1). The first plant was established by Westvaco in 1952; today it is the FMC plant and has become the largest soda ash operation in the world. Stauffer's Big Island Mine and plant were established in 1962, followed by Allied in 1968 and Texasgulf in 1976. Tenneco's new plant will begin operations in 1982. In addition, Church and Dwight's Southwest Wyoming plant is the largest and most modern sodium bicarbonate facility in the world.

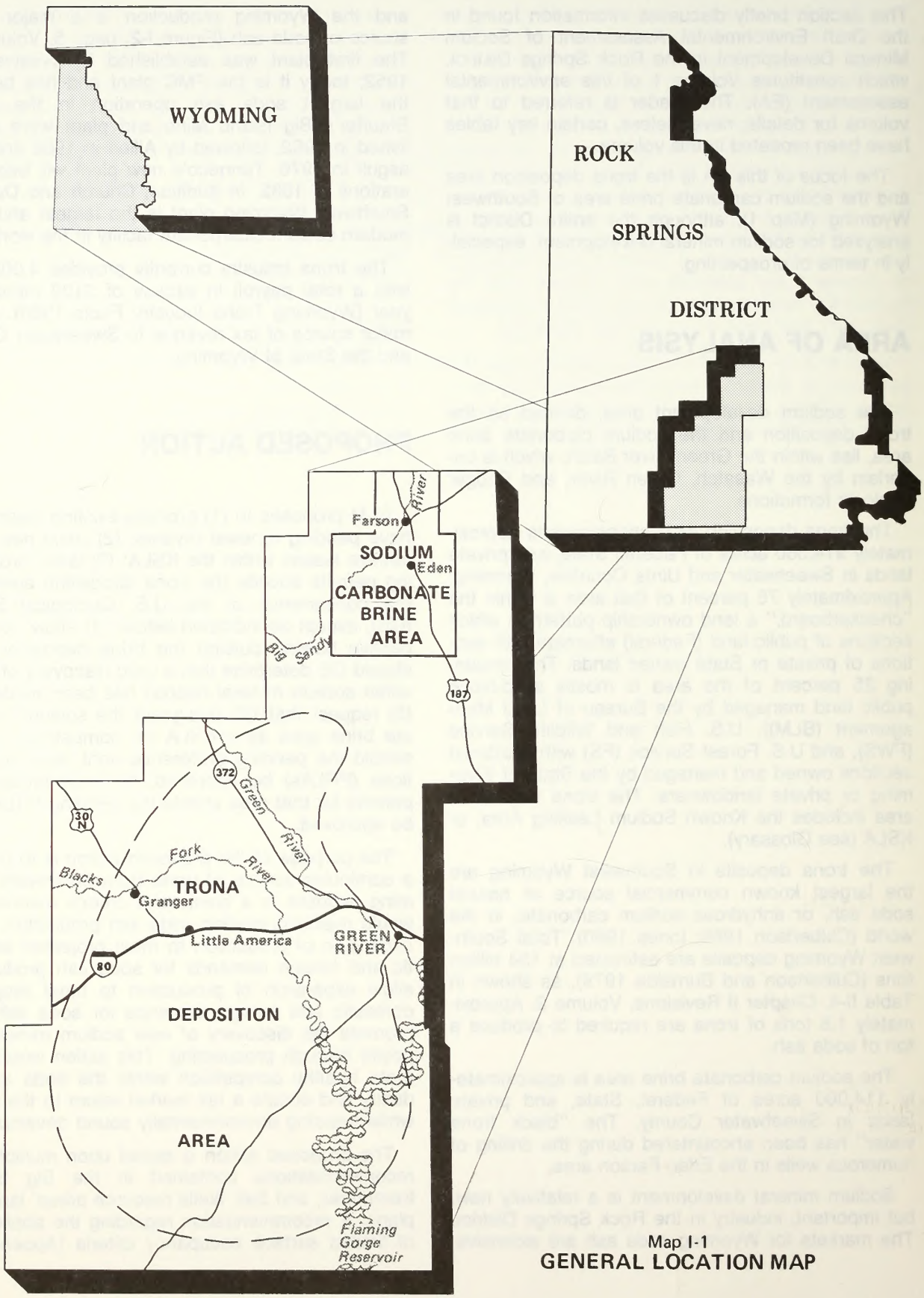
The trona industry currently provides 4,003 jobs with a total payroll in excess of $100 million per year (Wyoming Trona Industry Facts 1980). It is a major source of tax revenue to Sweetwater County and the State of Wyoming.

PROPOSED ACTION

BLM proposes to (1) process existing leases that have pending renewal reviews; (2) issue new competitive leases within the KSLA; (3) issue prospecting permits outside the trona deposition area, with the concurrence of the U.S. Geological Survey (GS), except as indicated below; (4) allow noncompetitive leasing outside the trona deposition area should GS determine that a valid discovery of a valuable sodium mineral deposit has been made; and (5) request that GS designate the sodium carbonate brine area as a KSLA for competitive leasing should the pending preference right lease applications (PRLAs) be approved, or issue prospecting permits for that area should the pending PRLAs not be approved.

The purpose of the proposed action is to provide a continuing source of trona from Southwest Wyoming deposits in a timely and orderly manner that would maintain existing soda ash production, allow expansion of production to meet projected domestic and foreign demands for soda ash production, allow expansion of production to meet projected domestic and foreign demands for soda ash, and promote the discovery of new sodium mineral deposits through prospecting. This action would promote healthy competition within the soda ash industry and ensure a fair market return to the public while assuring environmentally sound development.

The proposed action is based upon multiple use recommendations contained in the Big Sandy, Kemmerer, and Salt Wells resource areas' land use plans. A recommendation regarding the application of limited surface occupancy criteria (Appendix 1,



Map I-1
GENERAL LOCATION MAP

Volume 1) to all new leases, lease renewals, and development proposals serves as mitigation that is part of the proposed action. These eight criteria would be applied individually or in combination, depending upon the proposed activity, to lessen impacts upon resources and resource values as specified.

ALTERNATIVES

Four alternatives to the proposed action have been identified. In addition to the no-action alternative required by Council on Environmental Quality (CEQ) regulations, three variations of discretionary actions that BLM may approve, deny, or modify are considered: Alternative 1, No Competitive Leasing; Alternative 2, No Prospecting; and Alternative 3, Unlimited Prospecting.

Continuation of existing facilities and development of existing leases could occur under the no-action alternative; discretionary actions by BLM such as competitive leasing, prospecting permits, lease renewals, and issuing rights-of-way (ROW) necessary for development are not included in this alternative.

Under Alternative 1, all competitive lease applications would be denied and selected tracts for leasing wold not be nominated. Under Alternative 2, all prospecting permit applications would be denied and new competitive leases within the KSLA would be issued in the context of the planning objectives. Under Alternative 3, all pending and future prospecting permits, regardless of location would be processed under applicable regulations and new noncompetitive leases could be issued should discoveries be determined to be valuable.

SCENARIOS

BLM developed seven scenarios of potential sodium mineral development for the purpose of analyzing the impacts of the alternatives including the proposed action. Two possible levels of production were selected, 13.4 million and 15.4 million tons of soda ash per year, on the basis of market trends (Appendix 8, Volume 1). Additional raw trona production also is considered in some of the scenarios. The scenarios are various mixes of existing mines and plants and the projections of new mines and plants, including solution mining operations.

Table 1 shows the projected number of plants and mines with production for the year 2000. No action would be required of BLM for the developments in Scenarios 1 and 2 to occur. New competitive leases would be required of BLM for developments under Scenarios 3, 4, 5, and 6 to occur. Scenario 7 includes a small plant/mine development outside of the existing KSLA (0.4 million tons of soda ash per year) resulting from an approved PRLA. Such a development under Scenario 7 could occur anywhere in the District outside the KSLA, including the sodium carbonate brine area, within the context of each of the other scenarios and presumably with a consequent reduction in mine/plant production within the KSLA.

IMPACTS

Parameters of soda ash development under each scenario are listed in Table 2 (Table III-1 of Volume 1) for the short term (1990) and the long term (2000). Those parameters were used in determining the impacts of the alternatives including the proposed action, summarized in Table 3 (Table III-12 of Volume 1).

The basic mine/plant operation would require approximately 2,060 acres for a conventional mine and 2,300 acres for a solution mine. Based on existing facilities and company data, those acreage needs would include 1,200 acres for tailings ponds for the plant life; 300 acres for each plant site; 440 or 500 acres for ancillary facilities for a conventional or solution mine/plant operation, respectively; and 120 or 300 acres for a conventional or solution mine, respectively. Conventional mines without plants would disturb 420 acres and solution mines without plants would disturb 660 acres, including ancillary facilities.

The establishment of a new mine or plant could conflict with existing land uses such as livestock grazing, recreation, or wild horse and wildlife habitat and with future use such as development of other mineral resources. Surface disturbance caused by a new mine, a new plant, or the facilities associated with each would result in disturbance of soils and vegetation, loss of wildlife habitat and forage, reduction of animal unit months (AUMs) of forage available for livestock grazing, increases in fugitive dust and emissions of air pollutants, and potential impacts on cultural, recreation, and visual resources. Some alteration of the topography would occur in the construction of surface facilities, and mine sites would be subject to subsidence. Water resources would be affected, and waterfowl could be lost in the tailings ponds. Some reclamation of vegetation losses would be expected in the long term.

Increases in production, new plants, and new mines would create more jobs for construction, mine and plant workers, and result in increased tax revenues to the State of Wyoming and county government. Local businesses also would benefit. Resultant population increases would require more housing, schools, and public and private services.

Table 1

SUMMARY OF SODIUM DEVELOPMENT BY SCENARIO

	Scenario						
	1	2	3	4	5	6	7
Number of Trona Mines							
Existing	5	5	5	5	5	5	5
Projected	2	0	6	4	2	6	1-7
TOTAL	7	5	11	9	7	11	6-12
Estimated Trona Production in Million Tons Per Year [1]							
Existing Mines	24.1	24.1	20.5	20.5	20.5	17.6	16.9-24.1
Projected Mines	3.6	0	8.1	4.5	3.6	7.4	0.7-8.1
TOTAL	27.7	24.1	28.6 [2]	25.0 [2]	24.1	25.0 [2]	24.1-28.6
Number of Soda Ash Plants							
Existing	5	5	5	5	5	5	5
Projected	2	0	2	0	2	2	1-3
TOTAL	7	5	7	5	7	7	6-8
Soda Ash Production in Million Tons Per Year							
Existing Plants	13.4	13.4	13.4	13.4	11.4	11.4	11.0-13.4
New Plants	2.0	0	2.0	0	2.0	2.0	0.4-2.4
TOTAL	15.4	13.4	15.4	13.4	13.4	13.4	13.4-15.4

[1] Based on a production of 1.8 tons of trona per ton of soda ash.

[2] Includes 0.9 million tons for uses other than Wyoming soda ash production.

Table 2
PARAMETERS OF SODA ASH
PRODUCTION BY SCENARIO

	Existing 1/	Scenario 1		Scenario 2		Scenario 3		Scenario 4		Scenario 5		Scenario 6		Scenario 7	
		1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
U.S. Soda Ash Market in Million Short Tons															
Total Domestic Plus Exports	8.6	11.9	17.7	11.9	16.0	11.9	17.7	11.5	16.0	11.5	16.0	11.5	16.0	*	*
Wyoming Plants' Supply of Demand	6.8	10.4	15.4	10.1	13.4	10.3	15.4	9.7	13.4	9.7	13.4	9.7	13.4		
(% of U.S. Production)	(79%)	(87%)	(87%)	(85%)	(84%)	(86%)	(87%)	(84%)	(84%)	(84%)	(84%)	(84%)	(84%)	*	*
Wyoming Soda Ash Production in Million Short Tons															
Existing Plants 1/	6.8	10.4	13.4	10.1	13.4	10.3	13.4	9.7	13.4	9.7	11.4	9.7	11.4	*	*
New Plants	--	--	2.0	--	--	--	2.0	--	--	--	2.0	--	2.0	--	0.4 3/
TOTALS	6.8	10.4	15.4	10.1	13.4	10.3	15.4	9.7	13.4	9.7	13.4	9.7	13.4	--	--
Trona Required in Million Tons	12.24	18.72	27.72	18.18	24.12	18.72	28.62 9/	17.66	25.02 9/	17.66	24.12	17.66	25.02 9/	--	0.72
Employment															
Permanent 2/	3,835	4,910	6,310	4,910	5,721	5,045	6,405	4,910	5,680	4,910	5,730	5,045	6,100	*	155 8/
Construction	1,030	630	--	375	--	785	--	420	--	400	--	550	--	*	411 8/
TOTALS	4,865	5,540	6,310	5,285	5,721	5,830	6,405	5,330	5,680	5,310	5,730	5,595	6,100	--	--
Plant Sites in Acres 3/															
Existing Plants	1,800	2,150	2,700	2,150	2,700	2,320	2,700	1,820	2,700	1,820	2,500	1,820	2,500	*	*
New Plants	--	--	300	--	--	--	600	--	--	--	600	--	600	*	300 7/
TOTALS	1,800	2,150	3,000	2,150	2,700	2,320	3,300	1,820	2,700	1,820	3,100	1,820	3,100	--	--
Tailings Ponds in Acres 3/															
Existing Plants	4,000	4,400	6,800	4,400	6,800	4,400	6,800	4,400	6,800	4,400	6,200	4,400	6,200	*	*
New Plants	--	--	1,300	--	--	--	1,300	--	--	--	1,300	--	1,300	*	650 7/
TOTALS	4,000	4,400	8,100	4,400	6,800	4,400	8,100	4,400	6,800	4,400	7,500	4,400	7,500	--	--
Ancillary Facilities in Acres Disturbed 3/															
Existing Plants/Mines	2,300	1,200	2,800	1,400	2,700	1,400	2,700	1,400	2,700	1,400	2,500	1,400	2,500	*	*
New Plants/Mines	--	--	1,360	--	--	--	3,520	--	2,160	--	1,360	--	3,520	*	800 7/
TOTALS	2,300	1,200	4,160	1,400	2,700	1,400	6,220	1,400	4,860	1,400	3,860	1,400	6,020	--	--
Energy Consumption in Million BTUs Per Year 5/															
Existing Plants	46.8	74.9	96.5	72.7	96.5	74.1	96.5	69.8	96.5	74.9	82.1	69.8	82.1	*	*
New Plants	--	--	14.4	--	--	--	14.4	--	--	--	14.4	--	14.4	*	2.9 7/
TOTALS	46.8	74.9	110.9	72.7	96.5	74.1	110.9	69.8	96.5	74.9	96.5	69.8	96.5	--	--
Water Consumption in Acre-Feet Per Year 6/															
Existing Plants	23,287	35,619	45,894	34,591	45,950	35,276	45,894	33,606	45,894	33,606	39,044	33,606	39,044	*	*
New Plants	--	--	6,889	--	--	--	6,889	--	--	--	6,889	--	6,889	*	1,370 7/
TOTALS	23,315	35,619	52,743	34,591	45,950	35,276	52,743	33,606	45,894	33,606	45,894	33,606	45,894	--	--

1/ Includes Tenneco.

2/ Represents direct employment only (Table III-7).

3/ Represent company figures and BLM estimates (Table III-5).

4/ Rights-of-way for railroads, well, powerlines, access roads, etc.; represent company figures and BLM estimates.

5/ Based on 7.2 million BTU per 1 million tons soda ash production (Koatick 1980).

6/ Based on Wyoming Water Development Commission formula: Tons of trona X 0.62 X 1,000 gallons per ton divided by 325,850 gallons/acre-foot.

7/ These figures would be in addition to each of the other scenarios; *denotes the numbers could be from any of the other scenarios.

8/ Employment numbers represent peak construction and operating crews (Table III-7).

9/ Includes additional 0.9 million tons of trona which would not be processed into soda ash (see Chapter 1).

Table 3

IMPACTS OF THE ALTERNATIVES BY SCENARIO

Element	No-Action Alternative		Proposed Action*				Alternative 1 No Competitive Leasing
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7[1/]	Scenarios 1, 2, and 7
Anticipated Wyoming Soda Ash Production in Million Tons Per Year	15.4	13.4	15.4	13.4	13.4	13.4	13.4- 15.4	Impacts Same as Previously Shown Under Respective Scenario
Cumulative Use/Loss of Trona Reserves Through 2000 in Million Tons	397.18	374.23	397.9	374.33	373.53	374.33	373.5-397.9	"
Fossil Fuel Energy Consumption in Million BTUs Per Year[2/]	110.9	96.5	110.9	96.5	96.5	96.5	99.4-113.8	"
Percent of Conflict with Other Mineral Development Above Existing Situation	30	0	80	30	40	20	20-80	"
Disturbance of Soil/Vegetation Associations in Acres (includes Current Loss of 8,100 Acres)	15,560	12,200	17,620	14,060	14,460	16,620	13,950-19,150	"
Water Consumption in Acre-Feet Per Year[3/]	52,743	45,950	52,743	45,894	45,894	45,894	47,264-54,113	"
Big Game Summer Habitat Disturbed in Acres	7,100	4,100	9,300	6,350	6,000	8,300	5,700-10,900	"
Pronghorn Crucial Winter Habitat Disturbed in Acres	5,500	4,100	6,500	4,350	4,400	6,300	5,700- 8,100	"
Wintering Pronghorn Displaced[4/]	86	64	102	69	69	97	89-127	"
Waterfowl Lost Per Year in Tailings Ponds	90-100	90-100	90-100	90	90	90	90-110	"
Wild Horses Displaced	0	0	51	35	0	46	0-51	"
Livestock AUMs Lost[5/]	473	273	620	423	400	553	380-727	"
Acres of VRM Classes II and III Degraded to Classes III and IV[6/]	14,900	10,660	15,400	11,310	11,920	14,570	14,820-19,560	"
Total Direct Employment	6,310	5,421	6,405	5,680	5,730	6,100	5,576-6,560	
Total Indirect and Induced Employment	3,471	3,147	3,523	3,123	3,152	3,355	3,208-3,608	"
Total Population Increase From 1980	7,158	4,829	7,533	4,665	4,864	6,327	4,928-8,092	"
Total Personal Income in Millions of Dollars	209.68	190.11	212.84	188.75	190.41	202.70	195.26-214.83	"
Total Bachelor Residences Needed	804	729	816	724	730	777	743-835	"
Total Family Residences Needed	7,240	6,564	7,349	6,517	6,574	6,999	6,741-7,526	"
Additional School Enrollments[7/]	3,071	2,212	3,213	2,131	2,206	2,758	2,437-3,444	"
Public Revenue-Severance Tax in Millions of Dollars[8/]	19.29	16.78	19.91	16.78	16.78	17.41	16.78-19.91	"
Public Revenue-Production Tax in Millions of Dollars[8/]	25.07	21.81	25.88	21.81	21.81	22.62	21.81-25.88	"
Public Revenue-Property Tax in Millions of Dollars[8/]	14.04	8.14	15.01	8.47	12.43	13.40	9.64-16.51	"

*Scenarios One and Two are also included in Proposed Action.

1/Represents range of new development under Scenario 7 with the developments under other scenarios.

2/Based on 7.2 million BTU per 1 million tons soda ash production (Kostick 1980).

3/Based on Wyoming Water Development Commission formula: Tons of Trona X 0.62 X 1,000 gallons per ton divided by 325,850 gallons/acre-foot.

4/Based on District average of 3 pronghorn per square mile of crucial winter habitat.

5/Represent losses above estimated 540 AUMs lost to current development. Losses are based on average of 15 acres per AUM, although greater losses could occur if prime grazing areas were disturbed.

6/Does not include degradation of scenic quality that could occur in Flaming Gorge National Recreation Area under Scenarios Three and Five.

7/Represent increases over 6,341 enrolled in 1980.

8/In 1980 tax dollars.

Table 3
(Continued)
IMPACTS OF THE ALTERNATIVES BY SCENARIO

Element	Alternative 2- No Prospecting	Alternative 3-Unlimited Prospecting						
	Scenarios 1, 2, 3, 4, 5, and 6	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7[1]
Anticipated Wyoming Soda Ash Production In Million Tons Per Year	Impacts Same As Previously Shown Under Respective Scenario	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown
Cumulative Use/Loss of Trona Reserves Through 2000 in Million Tons	"	"	"	"	"	"	"	"
Fossil Fuel Energy Consumption in Million BTUs Per Year[2]	"	"	"	"	"	"	"	"
Percent of Conflict with Other Mineral Development Above Existing Situation	"	35	5	95	35	45	25	25-85
Disturbance of Soil/Vegetation Associations in Acres (Includes Current Loss of 8,100 Acres)	"	15,630	12,250	17,690	14,100	14,510	16,670	14,000-19,200
Water Consumption in Acre-Feet Per Year[3]	"	52,744	45,951	52,744	45,895	45,895	45,895	47,265-54,114
Big Game Summer Habitat Disturbed in Acres	"	7,170	4,150	9,370	6,400	6,050	8,350	5,750-10,970
Pronghorn Crucial Winter Habitat Disturbed in Acres	"	5,550	4,135	9,350	6,385	6,035	8,335	5,735-10,950
Wintering Pronghorn Displaced[4]	"	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown
Waterfowl Lost Per Year in Tailings Ponds	"	"	"	"	"	"	"	"
Wild Horses Displaced	"	"	"	"	"	"	"	"
Livestock AUMs Lost[5]	"	478	276	625	426	403	556	383-732
Acres of VRM Classes II and III Degraded to Classes III and IV[6]	"	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown
Total Direct Employment	"	Slightly Higher Than Previously Shown	Slightly Higher Than Previously Shown	Slightly Higher Than Previously Shown	Slightly Higher Than Previously Shown	Slightly Higher Than Previously Shown	Slightly Higher Than Previously Shown	Slightly Higher Than Previously Shown
Total Indirect and Induced Employment	"	"	"	"	"	"	"	"
Total Population Increase From 1980	"	"	"	"	"	"	"	"
Total Personal Income in Millions of Dollars	"	"	"	"	"	"	"	"
Total Bachelor Residences Needed	"	"	"	"	"	"	"	"
Total Family Residences Needed	"	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown	Same as Previously Shown
Additional School Enrollments[7]	"	"	"	"	"	"	"	"
Public Revenue-Severance Tax in Millions of Dollars[8]	"	"	"	"	"	"	"	"
Public Revenue-Production Tax in Millions of Dollars[8]	"	"	"	"	"	"	"	"
Public Revenue-Property Tax in Millions of Dollars[8]	"	"	"	"	"	"	"	"

*Scenarios One and Two are also included in Proposed Action.

1/Represents range of new development under Scenario 7 with the developments uner other scenarios.

2/Based on 7.2 million BTU per 1 million tons soda ash production (Kostick 1980).

3/Based on Wyoming Water Development Commission formula: Tons of Trona X 0.62 X 1,000 gallons per ton divided by 325,850 gallons/acre-foot.

4/Based on District average of 3 pronghorn per square mile of crucial winter habitat.

5/Represent losses above estimated 540 AUMs lost to current development. Losses are based on average of 15 acres per AUM, although greater losses could occur if prime grazing areas were disturbed.

6/Does not include degradation of scenic quality that could occur in Flaming Gorge National Recreation Area under Scenarios Three and Five.

7/Represent increases over 6,341 enrolled in 1980.

8/In 1980 tax dollars.

REVISIONS OF DRAFT ENVIRONMENTAL ASSESSMENT

Revisions in this section refer to Volume 1, the draft environmental assessment, by page, column, etc. The revisions were made on the basis of public comments, new information, and the Bureau of Land Management's own review process. Mitigation revisions appear in a separate section, and additions have been made to the Glossary and Literature Cited sections.

Chapter I Revisions

Page 7, left column, second paragraph, last line, is revised to read:

Leasing Area (KSLA; see Glossary and Map 1-2).

Page 7, right column, last paragraph, is revised to read:

1. Issue new competitive leases within the KSLA (Map 1-2) in the context of the planning objectives previously mentioned.

Page 11, left column, first paragraph, first sentence, has been revised to read:

2. Issue prospecting permits outside the trona deposition area, except for the pending actions in the sodium carbonate brine area as discussed below.

Page 15, right column, section on Scenario 4, is revised to read as follows:

SCENARIO 4

This scenario involves a moderate level of production (13.4 MTPY) projected for the year 2000. This production level would be met through accelerated expansion of existing plants, normal expansion of existing mines, and development of four new mines. New competitive lease action would be required of BLM for this development to occur. The dimensions of the variables are as follows:

1. Moderate level of production (13.4 MTPY)

2. Accelerated expansion of existing plants to a processing level of 13.4 MTPY.

3. Normal expansion of existing mines to a production level of 11.4 MTPY.

4. New plants - None.

5. New mines - Four: Two conventional and two solution mines. The conventional mines would produce 1.0 MTPY. The two solution mines would produce a total of 1.5 MTPY. It is assumed that 0.5 MTPY production (soda ash equivalent) from a new conventional mine would be provided to the Bridger Power Plant to scrub stack gas and for shipment to other markets as raw trona.

See Map 1-6 and Table 1-6.

Page 29, left column, first line, is changed to:

Minerals Management Service (MMS).

(This reflects a name change since Volume 1 was printed, and it is inferred that further references to Geological Survey (GS) are revised to MMS except where noted as a literature citation or in actions prior to the change in title).

Page 29, right column, first line after State of Wyoming, is changed to:

Commissioner of Public Lands

The paragraph following the above line is replaced by the following:

The Wyoming Commissioner of Public Lands is responsible for the administration, leasing and management of lands owned by the State of Wyoming. Right-of-way permits must be obtained prior to any access across or before construction begins on State-owned lands.

Page 29, right column, last paragraph, is revised to read:

The Wyoming State Engineer is responsible for the appropriation and administration of the water resources in Wyoming. Applications to appropriate water must be filed with the State Engineer. The applications must be approved by the State Engineer and a State permit must be issued prior to undertaking proposed water developments. Tailings ponds and other water impoundments require a review by the State Engineer prior to the issuance of a state permit for impoundment. The State Engineer also issues temporary use permits for unappropriated water.

Chapter II Revisions

Page 33, left column, sixth paragraph, is revised to read:

The State of Wyoming was initially classified a Class II area with the exception of five wilderness areas and two national parks larger than 6,000 acres, which have been classified mandatory Class I. None of the present Class I areas are located in or adjacent to the sodium development area (Science Applications, Inc. 1980). Areas located in or adjacent to the sodium development area that could gain permanent Class I status in the near future include the Flaming Gorge National Recreation Area (NRA), managed by the Forest Service, and any areas designated by the Congress as wilderness. Areas are recommended as Class I for air quality by the respective government agencies; the final decision would be made by the State of Wyoming.

Page 36, right column, first paragraph under Geology and Mineral Resources, the following sentences are added:

The Wyoming Geological Survey notes diamonds may occur in the area. Chrome diopside and pyrope garnet have been found in the southern portion of the trona deposition area.

Page 37, left column, last paragraph, is revised to read as follows, deleting common salt at top of right column:

Other sodium minerals are associated with the trona and oil shale deposits (Bates 1969), but they occur in minor quantities and essentially have no potential commercial use. Those minerals include:

Page 38, Table II-4, has been revised; see revised table.

Page 41, left column, first paragraph, is revised to read:

Currently there is no oil shale mining in the sodium development area, and no commercial development is expected within the next 10 years. An in situ research project near Green River was conducted for several years by the Department of Energy and the former Energy Research and Development Administration (ERDA). Colorado Synfuels has conducted exploratory tests on State lands in the area.

Page 41, left column, under Oil Shale, the following paragraph is added:

Oil shale beds of the Wilkins Peak, Laney Shale, and Tipton Shale Members of the Green River Formation occur in and around the sodium mineral development area. The thickest and richest beds generally occur in the southeastern corner of the area (Culbertson 1969). The Wilkins Peak Member in section 32, T. 15 N., R. 108 W., is 1,175 feet thick, of which 15 percent is oil shale yielding 10 to 43 gallons of oil shale per ton. The beds thin northward and westward. The upper part of the Tipton Shale Member in T. 16 N., R. 110 W., contains about 40 feet of oil shale yielding an average of 30 gallons per ton. The Laney Shale Member in T. 13 N., R. 108 W., contains an estimated 400 feet of oil shale; the average yield is 14 to 18 gallons per ton (Culbertson 1969). Many oil shale beds are exposed in the area.

Page 44, right column, last paragraph, is followed by this paragraph:

Some seeps and springs occur in the area, and they are used by livestock and wildlife. The Green River also is designated as Class I fisheries habitat by the Wyoming Game and Fish Department.

Page 46, left column, fourth paragraph, last sentence, is revised to read:

See Appendix 5 for a summary of the water quality at selected sites in the sodium development area.

Page 49, left column, last paragraph under Threatened or Endangered Plants, first sentence is revised to read:

None of the above plants are suspected to occur within the KSLA.

Page 49, right column, second paragraph, is amended to read:

Federally-listed species which could occur in the area are the peregrine falcon, bald eagle, whooping crane, and the black-footed ferret. Species of high State interest include the burrowing owl, merlin, and midget faded rattlesnake. Merlin nest along the Green River, and the midget faded rattlesnake is restricted to six to eight denning sites around the Flaming Gorge.

Page 49, right column, insert after fourth paragraph and amend fourth paragraph to read:

Whooping cranes use the Green River drainage as a migration route between the Greys Lake National Wildlife Refuge in Idaho and wintering areas in New Mexico. They have occasionally been observed along the Green River within the KSLA (pers. comm., Serdiux 1981).

It is generally accepted that black-footed ferrets are associated with prairie dogs, which serve as a food source. Black-footed ferrets were recently found in the Meeteetse area of Wyoming; however, sites essential for black-footed ferrets' recovery in southwestern Wyoming have not been identified.

Table II-4

ESTIMATED IDENTIFIED RESOURCES OF TRONA AND INTERMIXED TRONA AND HALITE BY BED IN THE GREEN RIVER BASIN, SOUTHWESTERN WYOMING

Bed No.	Total Resources: Trona and Mixed Trona - Halite		Trona Resources: ` 4 ft. Thick		Trona Resources: ¨ 4 ft. Thick		Mixed Trona - Halite Resources: ` 4 ft. Thick		Mixed Trona - Halite Resources: ¨ 4 ft. Thick	
	Area in Square Miles	Billion Short Tons	Area in Square Miles	Billion Short Tons	Area in Square Miles	Billion Short Tons	Area in Square Miles	Billion Short Tons	Area in Square Miles	Billion Short Tons
1	324	5.4	104	0.4	220	5.0	---	---	---	---
2	469	10.0	100	0.4	364	9.4	---	---	5	0.2
3	442	3.5	242	0.9	194	2.5	---	---	6	0.1
4	528	6.3	190	0.7	338	5.6	---	---	---	---
5	712	9.5	221	0.8	401	6.6	5	`0.1	85	2.1
6	587	6.0	219	0.8	78	0.9	---	---	290	4.3
7	617	3.6	381	1.4	221	2.1	9	`0.1	6	0.1
8	431	1.9	373	1.4	58	0.5	---	---	---	---
9	733	9.6	270	1.0	70	0.8	29	0.1	364	7.7
10	459	4.8	56	0.2	26	0.3	119	0.4	258	3.9
11	615	6.9	235	0.9	32	0.4	2	`0.1	346	5.6
12	811	10.7	201	0.7	344	4.5	---	---	266	5.5
13	370	1.8	305	1.1	65	0.7	---	---	---	---
14	774	12.0	151	0.6	372	5.4	---	---	251	6.0
15	848	11.8	232	0.9	271	3.7	2	`0.1	343	7.2
16	860	7.2	524	1.9	117	1.3	---	---	219	4.0
17	870	12.3	199	0.7	429	7.0	3	`0.1	233	4.6
18	276	1.4	104	0.4	6	0.1	117	0.4	49	0.5
19	208	1.5	118	0.4	90	1.1	---	---	---	---
20	217	1.9	103	0.4	114	1.5	---	---	---	---
21	310	1.3	290	1.1	20	0.2	---	---	---	---
22	267	1.2	234	0.9	3	0.3	---	---	---	---
23	293	1.2	268	1.0	24	0.2	---	---	---	---
24	153	1.4	92	0.3	61	1.1	---	---	---	---
25	105	1.2	50	0.2	55	1.0	---	---	---	---
	TOTALS	134.4		19.5		62.2		0.9+		51.8

Source: Culbertson and Burnside (1979).

Page 51, left column, first paragraph, the last sentence is deleted.

Page 51, left column, second paragraph, the first sentence is revised to read:

This species occurs infrequently as a resident in the majority of the area, but usually inhabits riparian areas along the Green and Blacks Fork rivers.

Page 51, right column, third paragraph, third sentence is amended to read:

Major strutting grounds and breeding complexes occur within the sodium development area (Map II-4); detailed information on the locations of these ground and complexes are available for review in the Rock Springs District Office.

Page 53, right column, first paragraph, after second sentence, is amended by adding the following sentence:

The Wyoming Game and Fish Department has designated the Green River within the sodium mineral development area as a Class I fisheries, i.e., a blueribbon trout stream.

Page 55, right column, beginning with eighth line, text is revised to read:

Slightly more than one percent of the area (13,745 acres out of a total area of 1,028,560 acres) has been surveyed. A total of 350 sites were located in these surveys for an average site density of 16.3 sites per square mile. Because these surveys were concentrated in oil and gas and trona areas, many ecological zones are poorly surveyed and the average number of sites per square mile most likely would be significantly changed with an adequate random sampling of the area. Using the biased average of 16.3 sites per square mile, a total of 26,196 sites for the sodium development area could be predicted.

Page 60, left column, first paragraph under Management Classes, first sentence, is revised to read:

The Flaming Gorge NRA (Map I-1) qualifies as a Class I Visual Resource Management (VRM) area.

Page 60, left column, third paragraph under Management Classes, first sentence, is revised to read:

The Flaming Gorge NRA is classified as VRM Class I, and the three BLM wilderness study areas in the sodium development area are managed for VRM Class II.

Page 60, right column, second paragraph, is revised to read:

Three areas within the sodium development area (Map II-6) have been designated as WSAs and will be considered in the Bureau's Rock Springs District wilderness environmental impact statement. Management Framework Plan (MFP) recommendations (BLM 1981a, 1981b) are that the three areas are not suitable for wilderness designation.

Page 61, left column, first paragraph, second line, the number of visitor-days should be:

706,400

Page 71, Table II-23, title is revised to read:

TYPE HOUSING IN UINTA COUNTY

Page 75, Table II-26, footnote 3, should read:

Calculated from Abstract of Assessment Rolls, Sweetwater County 1976 through 1980.

Chapter III Revisions

Page 77, right column, item 2 under Assumptions, is revised to read:

2. For purposes of analysis, the average acreage encompassed over the long term by tailings ponds for each plant site, including existing pond, is 1,200 acres. Short-term requirement for tailings ponds to support a 1.0 MTPY plant production is 650 acres (BLM/USGS 1975).

Page 77, right column, item 3, last sentence, is revised to read:

The average acreage disturbance figure for ancillary facilities under conventional mining, including existing facilities, is 440 acres.

Page 77, right column, item 4, is revised to read:

4. Each conventional mine and plant site averages 420 acres of disturbance; this includes existing facilities.

Page 77, right column, item 6, is revised to read:

6. Solution mines are assumed to disturb 300 acres. The plant site would encompass 300 acres and ancillary facilities would cover 500 acres.

Page 86, left column, third paragraph, is revised to read:

The highly alkaline nature of the trona production tailings would result in permanent soil modification. The concentrations of chemicals, combined with the extreme alkalinity, would render the site incapable of growing any vegetation.

Page 88, left column, second paragraph, last sentence, is revised to read:

A stable vegetative cover is usually established 5 to 10 years after seeding with a return to the present stable community over a 20 to 50-year period.

Table II-24

SUMMARY OF SCHOOL FACILITIES
SWEETWATER SCHOOL DISTRICT NO. 1

Location	Name	Capacity Recommended*	Capacity Maximum	1980 Enrollment
Elementary (K-6, 8)				
Rock Springs	Desert View	320	410	364
	Lincoln	320	410	314
	Lowell	135	180	156
	Overland	520	650	533
	Roosevelt	135	180	153
	Walnut	320	410	302
	Washington	310	350	375
	Yellowstone	430	550	362
		2,490	3,140	2,559
Reliance	Reliance	350	370	358
Wamsutter	Desert (K-8)	230	300	234
Superior	Superior	160	190	92
Farson-Eden	Farson-Eden	200	275	234
Secondary				
Rock Springs	East Jr. High (7-9)	800	1,100	598
	White Mt. Jr. (7-9)	800	1,000	517
	Senior High (10-12)	1,120	1,400	977
		2,720	3,500	2,092
Farson-Eden	Farson-Eden High (7-12)	100	135	71

*Recommended by School District.

As an additional service, the district shares its facilities with the community. A full-time community services director coordinates the use of school facilities, including two swimming pools, one handball court, two auditoriums, gymnasiums, and playgrounds. The facilities are open from 5:00 p.m. to midnight, and nominal fees are charged at the discretion of the district.

Source: School District No. 1.

Page 88, left column, item c, tenth line, is amended to read:

...concentrated highly alkaline waste...

Page 88, left column, item d, the following sentence is inserted before the last paragraph:

Stocker later (pers. comm., 1981) reported that, although the amount from each type of emission is difficult to assess owing to the variation in trona quality and the possible combination of emission sources, 1977 data indicated that 40-50% of TSP was sodium compounds.

Page 88, right column, after last paragraph, the following is inserted:

No impact to threatened plants is expected.

Page 89, Table III-5, is revised; see revised table.

Page 90, left column, second paragraph under Birds, second sentence, is revised to read:

Under certain climatic conditions, especially in the fall, salt crystallization on birds' feathers after one hour in these ponds render the birds incapable of flying.

Page 90, right column, third paragraph, first sentence, is revised to read:

The proposed action under all scenarios would contribute to the cumulative adverse impact on the quality of aquatic wildlife habitat in the KSLA.

Page 90, right column, fourth paragraph, first sentence, is revised to read:

Sodium development-related flow reductions under the scenarios would amount to 63-73 cubic feet per second (cfs). That is equal to 21 to 24% of the estimated 300 cfs 'survival flow' for the Green River trout fishery.

Page 94, left column, paragraph under Land Uses, is revised to read:

The area's land use would be converted from agricultural to industrial in the acreages shown in Table III-1. Should heavy trucks use the current transportation system for hauling trona, soda ash, or heavy equipment, major reconstruction of Highway 530 may be necessary; also, new highways may be needed.

Page 94, right column, third paragraph, is amended by inserting the following before the last sentence:

An addition to the new Rock Springs facility is being constructed. In addition, the White Mountain Sewer and Water District plans to construct a sewage collection system and has received State Farm Board funding for the project.

Page 102, Table III-10, footnote 1, first sentence, should read:

Total bachelor residences calculated at 0.33 required per construction employee, assuming that 50% of the bachelors share a residence; 0.1 residence required per operational employee; and 0.05 residence required per service sector employee.

Page 104, Table III-11, footnote 2, first sentence, should read:

Tax calculated using a constant 71.48 mill levy, 92% taxable trona production, and 5.5% severance tax.

Page 104, Table III-11, footnote 3, item 3, should read:

(3) One million ton expansion in plant and mine facilities estimated at $63 million for Texasgulf (Rocket-Miner 11/13/80).

Page 106, left column, last paragraph, first sentence, should read:

The expansion of the existing operations and construction of two plants, and development within the sodium carbonate brine area would increase concentrations of TSP, SO_2, and NO_2.

Page 118, left column, first paragraph under Mitigating Measures, is revised to read:

The mitigating mesures which follow are supplemental to the existing and proposed standard stipulations provided with and contained in prospecting permits (Form 3510-1); sodium leases (Form 3520-3); and rights-of-way (for railroads, pole powerlines and telephone lines, pipelines and buried cables, and roads and highways, under Wyoming State Office Instruction Memorandum WY-81-413 and appropriate Code of Federal Reglations standards). These forms are contained in Appendix 2. Additional site specific stipulations may be applied to individual permits. These measures supplement and, in some cases, duplicate what is required by various other agencies (i.e., Wyoming Department of Environmental Quality (DEQ), Environmental Protection Agency (EPA), etc.) related especially to air quality and water quality and quantity. Nevertheless, consideration of these measures are necessary to determine the residual impacts of sodium mineral development.

Page 118, left column, after second paragraph under Mitigating Measures: The last paragraph, right column, page 126, should be inserted.

Page 124, right column, Vegetation paragraph, is amended to read:

Approximately 2,000 acres of vegetation would be impacted for each plant/mine operation. In the short term (10 years), there would be a loss of 134

Table III-5

ACRES AFFECTED BY TYPE OF DISTURBANCE/SCENARIO BY YEAR 2000

	Current Disturbance	Total Disturbance Due to Existing Plant Expansion By 2000	New Disturbance Due to New Conventional Plants and Mines	New Disturbance Due to Solution Plants and Mines	New Disturbance Due to Black Water Development	Total Disturbance
Scenario One						
A. Plant Sites	1,800	2,700	300	300	--	3,300
B. ROWs/Ancillary Facilities	2,300	2,800	560	800	--	4,160
C. Tailings Ponds	4,000	6,800	650	650	--	8,100
Scenario Two						
A. Plant Sites	1,800	2,700	--	--	--	2,700
B. ROWs/Ancillary Facilities	2,300	2,700	--	--	--	2,700
C. Tailings Ponds	4,000	6,800	--	--	--	6,800
Scenario Three						
A. Plant Sites	1,800	2,700	300	300	--	3,300
B. ROWs/Ancillary Facilities	2,300	2,700	1,400[1/]	2,120[2/]	--	6,220
C. Tailings Ponds	4,000	6,800	650[3/]	650	--	8,100
Scenario Four						
A. Plant Sites	1,800	2,700	--	--	--	2,400
B. ROWs/Ancillary Facilities	2,300	2,700	840	1,320	--	4,860
C. Tailings Ponds	4,000	6,800	--	--	--	6,800
Scenario Five						
A. Plant Sites	1,800	2,500	300	300	--	3,100
B. ROWs/Ancillary Facilities	2,300	2,500	560	800	--	3,860
C. Tailings Ponds	4,000	6,200	650	650	--	7,500
Scenario Six						
A. Plant Sites	1,800	2,500	300	300	--	3,100
B. ROWs/Ancillary Facilities	2,300	2,500	1,400[1/]	2,120[2/]	--	6,020
C. Tailings Ponds	4,000	6,200	650	650	--	7,500
Scenario Seven						
A. Plant Sites	1,800	[4/]	[4/]	[4/]	300	2,100[5/]
B. ROWs/Ancillary Facilities	2,300	[4/]	[4/]	[4/]	800	3,100[5/]
C. Tailings Ponds	4,000	[4/]	[4/]	[4/]	650	4,650[5/]

[1/] Acres affected by ancillary facilities are estimated to be 300 for a mine and 440 for a mine/plant operation; mine site would affect an additional 120 acres.

[2/] Acres affected by ancillary facilities are estimated to be 360 for a mine and 500 for a mine/plant operation; mine site would affet an additional 300 acres.

[3/] Represents tailings pond disturbance for new plant only; disturbance is estimated for tailing pond necessary to initiate 1 million tons per year soda ash production (BLM/USGS 1975).

[4/] This scenario would occur concurrently with any of the above scenarios.

[5/] Total for new plant/mine and the current disturbance; add new disturbance created by any of the above scenarios for an estimate of the total impact.

AUMs for livestock and wildlife. Long-term losses would be 106 AUMs per new plant/mine operation. Unless new methods of restoration are developed for tailings ponds 80 AUMs will be lost permanently. These figures can be multiplied by the number of operations in the KSLA for an overall view of the impact of trona mining to the vegetation. Existing facility losses of 540 AUMs would be reduced to 416 in the long term.

Page 125, left column, fourth line, is amended by adding the following sentence:

Some off-site mitigation of this impact would be possible.

Page 125, right column, Livestock Grazing paragraph, is amended to read:

Short-term losses per plant/mine development would be 134 AUMs, in addition to the 540 AUMs out of production due to existing facilities. In the long term, losses to existing facilities would be reduced to 416 AUMs and to each new development to 106 AUMs. Some off-site mitigation of this impact could be possible. Upon restoration, an estimated 80 AUMs per development would be lost due to the inability to restore tailings ponds. Harassment of livestock could continue.

Page 125, right column, paragraph under Recreation Uses, last sentence should be deleted.

Page 125, right column, and Page 126, left column, Short-Term Uses Versus Long-Term Productivity, is revised as follows:

In the short term there would be:

1. A change from agricultural to industrial use of about 2,000 acres per plant/mine site.

2. The use of up to 52,743 acre-feet of water per year.

3. Production of 13.4 to 15.4 million tons of soda ash, or more, depending upon the market.

4. Increased employment opportunities in Sweetwater and Uinta Counties.

5. More housing and other facilities related to soda ash development.

In the long term there would be:

1. A reduction in air quality due to increased and cumulative emissions.

2. Loss of 106 AUMs for livestock grazing per plant site, pending off-site range improvements.

3. The use of up to 52,743 acre-feet of water per year.

4. A decline in fisheries due to increased water usage and increased sedimentation.

5. The inability to put the tailings pond back into production would amount to a permanent loss approximately 80 AUMs per plant site.

6. The lowering of the quality of outdoor recreation due to increased population and industrial development.

7. Constraint of the development of other minerals such as oil shale, oil, and gas.

8. Discovery of previously unknown archeologic and paleontologic resources.

9. A fairly stable economic base with job security and tax income to the county due to the longevity of the industry.

10. Improvements in transportation systems, railroads and highways in support of the mineral development.

Pages A-2 to A-12, Tables A1-1 through A1-6 are revised; see revised tables.

Page A-30, right column, last paragraph, first sentence, is revised to read:

A tailings pond covering about 650 acres of surface area is needed to support the operation of a one MTPY soda ash plant (BLM/USGS 1975).

Pages A-53 and A-54, Tables A7-2 and A7-3 are revised; see revised tables.

Table A1-1

PENDING PROSPECTING PERMIT APPLICATIONS IN TRONA DEPOSITION AREA

Applicant	Prospecting Permit No.	Legal Description	Acres	Entirely Within KSLA
Joann Yates	W-19980	Secs. 20, 29, 30, & 32, T. 15 N., R. 111 W.	2,551.88	Yes
Martin Yates III & S.P. Yates	W-19981	Sec. 19, T. 15 N., R. 111 W. Secs. 22, 23, & 24, T. 15 N., R. 112 W.	2,551.00	Yes
Martin Yates III & S.P. Yates	W-19982	Secs. 21, 25, 26, & 27, T. 15 N., R. 112 W.	2,560.00	Yes
Thomas C. Woodward	W-41146	Lots 5, 6, 7, 8, S1/2 Sec. 4; & W1/2NE1/4, E1/2NW1/4, W1/2W1/2, NE1/4SW1/4 Sec. 10; T. 20 N., R. 108 W. Lots 5, 6, 7, 8, E1/2W1/2, W1/2SE1/4, SE1/4SE1/4 Sec. 30; T. 21 N., R. 107 W. S1/2S1/2 Sec. 14; SW1/4SE1/4, NW1/4, S1/2 Sec. 24, & Sec. 26; T. 21 N., R. 108 W.	2,475.32	No
Thomas C. Woodward	W-45027	Sec. 22; E1/2 Sec. 28; & Sec. 34; T. 20 N., R. 108 W.	1,600.00	No
Thomas C. Woodward	W-41147	Lots 6, 7, 8, SW1/4NE1/4, SE1/4NW1/4, NE1/4SW1/4, NW1/4SE1/4, & S1/2SE1/4 Sec. 4; S1/2 Sec. 8; &	2,248.09	No
		Lots 2, 3, 4, & 5, W1/2 SW1/4,SE 1/4,Sec. 10; T. 19 N., R. 108 W.		No
		Sec. 20, W1/2W1/2, Sec. 28; & Sec. 32; T. 20 N., R. 108 W.		No Yes No No
Stauffer Chemical	W-59477	Sec. 18, T. 21 N., R. 108 W. Sec. 14, & Sec. 24, T. 21 N., R. 109 W.	1,893.44	
Stauffer Chemical	W-59525	NE1/4, S1/2, Sec. 22; & N 1/2 NE1/4 Sec. 26; T. 21 N., R. 109 W.	1,120.00	No Yes

Table A1-2

PENDING PROSPECTING PERMIT APPLICATIONS IN SODIUM CARBONATE BRINE AREA

Applicant	Prospecting Permit No.	Legal Description	Acres	Entirely Within Area
Mintech Corporstion	W-52441	NE1/4, S1/2NW1/4, S1/2 Sec. 13; SE1/4 Sec. 14; SE1/4 Sec. 22; Sec. 23; Sec. 24; NW1/4, W1/2SW1/4 Sec. 25; & SE1/4, Sec. 26; T. 24 N., R. 106 W.	2,560.00	Yes
Mintech Corporation	W-52440	W1/2, NE1/4, Sec. 26; E1/2NW1/4, SW1/4NW1/4, SW1/4, E1/2 Sec. 27; S1/2SE1/4 Sec. 28; W1/2, NE1/4 Sec. 33; N1/2, E1/2SW1/4, SW1/4SW1/4, SE1/4 Sec. 34; & N1/2 Sec. 35, T. 24 N., R. 106 W.	2,560.00	Yes
John N. Tippit	W-35485	Secs. 2, 3, 10, & 11, T. 23 N., R. 107 W.	2,565.48	Yes
John N. Tippit	W-35484	Secs. 4, 5, 8, & 9, T. 23 N., R. 107 W.	2,571.84	Yes
Oluf N. Nielson	W-35487	Secs. 27, 28, 34, & 35, T. 24 N., R. 107 W.	2,560.00	Yes
Oluf N. Nielson	W-35486	N1/2, N1/2S1/2, SW1/4SW1/4, SE1/4SW/4 Sec. 26, NW1/4NE1/4, SE1/4NE1/4, W1/2, W1/2SE1/4, Sec. 29; NW1/4NE1/4, SE1/4NE1/4, NW1/4, S1/2S1/2, NE1/4SE1/4, Sec. 32; & Sec. 33, T. 24 N., R. 107 W.	2,120.00	Yes
W. L. Whestley	W-32603	Sec. 14; E1/2 Sec. 15; E1/2 Sec. 21; Sec. 22; E1/2 Sec. 28; & E1/2 Sec. 33 T. 23 N., R. 106 W.	2,560.00	Yes
Tom Wheatley, Jr.	W-32059	Lots 3, 4, 5, 6, 7, SE1/4NW1/4, SW1/4E1/2 Sec. 6; Lots 1, 2, 3, 4, E1/2W1/2 Sec. 7; Sec. 11; Lots 1, 2, 3, 4, E1/2W1/2 Sec. 18; Lots 1, 2, 3, 4, E1/2W1/2 Sec. 19; Lots 1, 2, 3, E1/2 NW1/4, NE1/4SW1/4 Sec. 30; & Lots 1, 2, 3, 4, E1/2 W1/2 Sec. 31; T. 23 N., R. 106 W.	2,406.02	Yes
Phillip E. Johnson	W-71568	Secs. 8, 9; W1/2 Sec 15; Sec. 17; E1/2 Sec. 18; T. 23 N., R. 108 W.		Yes
Grace Sulenta	W-71777	S1/2S1/2 Sec. 19; Secs. 20, 21, 22, & 29; T. 28 N., R. 107 W.	2,400.00	Yes
John Sulenta	W-71778	Secs. 15, 17, & 18; N1/2, N1/2S1/2 Sec. 19; T. 28 N., R. 107 W.	2,400.00	Yes
Phillip E. Johnson	W-71567	Lots 1, 2, 3, 4, NE1/4SW1/4, S1/2SW1/4, SE1/4 Sec. 1; Lots 1, 2, 3, 4, S1/2 N1/2, N1/2 S1/2, S1/2 SW1/4, SW1/4 SE1/4 Sec. 2; Lots 1, 2, 3, 4, S1/2N1/2, S1/2 Sec. 3 Sec. 10 W1/2NE1/4,NW1/4 Sec. 11; T. 23 N., R. 108 W.		Yes

Table A1-2
(continued)

Applicant	Prospecting Permit No.	Legal Description	Acres	Entirely Within Area
Bradford Wells	W-71569	S1/2 Sec. 11; Secs. 12, 13, 14; E1/2 Sec. 15 T. 23 N., R. 108 W.		Yes
Bradford Wells	W-71570	Secs. 6, 7, 17, & 18; T.23 N., R. 107 W.	2,560	Yes
Michael Spence	W-71571	Secs. 14, 15; N1/2, NW1/4SW1/4, E1/2SW1/4, SE1/4 Sec. 21; Sec. 22; NW1/4NW1/4 Sec. 23; T. 24 N., R. 107 W.	2,560	Yes
Michael Spence	W-71572	Secs. 17, 18, 19, 20; T. 24 N., R. 107 W.	2,560	Yes
James Mosley	W-71573	Sec. 30; N1/2, N1/2SW1/4, SW1/4SW1/4, S1/2SE1/4 Sec. 31; T. 24 N., R. 107 W. S1/2SE1/4, NE1/4SE1/4 Sec. 13; Secs. 24, 25; T. 24 N., R. 108 W.	2,560	Yes
James Mosley	W-71574	Secs. 26, 27, 34, 35; T. 24 N., R. 108 W.	2,560	Yes
Gerald Stout	W-71770	Secs. 4, 5, 6, 7, 8, 12; T. 28 N., R. 107 W.	2,400	Yes

Table A1-3

PREFERENCE RIGHT LEASE APPLICATIONS REJECTED AND APPEALED AWAITING DECISION

Applicant	Prospecting Permit No.	Legal Description	Acres	Dated Filed
Marine Minerals Corporation	W-25391	W1/2 Sec. 17; E1/2 Sec. 18, E1/2 Sec. 19; W1/2 Sec. 20; W1/2 Sec. 29; E1/2 Sec. 30; E1/2 Sec. 31; W1/2 Sec. 32; T. 23 N., R. 106 W.	2,560	8-7-70 Appeal Filed 8-7-75
Marine Minerals Corporation	W-25392	W1/2 Sec. 5; E1/2 Sec. 6; E1/2 Sec. 7; W1/2 Sec. 8; T. 23 N., R. 106 W. S1/2SW1/4 Sec. 29; Lot 4, SE1/4SW1/4 Sec. 30; Sec. 31; W1/2 Sec. 32; T. 24 N., R. 106 W.	2,538	8-7-70 Appeal Filed 8-7-75
John S. Wold Eugene V. Simons	W-9026	Secs. 12 & 14; Lots 1, 2, N1/2NE1/4, NW 1/4, W1/2 SW1/4 Sec. 22; Sec. 24; T. 15N., R. 108 W.	2,189.88	10-3-67 Appeal Filed 8-6-79
John S. Wold Eugene V. Simons	W-9027	Sec. 6 T. 15 N., R. 107 W. Sec. 30 T. 16 N., R. 107 W. Secs. 2 & 10 T. 15 N., R. 108 W.	2,516.41	10-3-67 Appeal Filed 8-6-79

Table A1-4

PRODUCING SODIUM LEASES

BLM Lease No.	Name of Lessee	Legal Description	Acres	Expiration Date
E-022955	Allied Chemical Co.	Secs. 6, 8, & 18 T. 18 N., R. 109 W.	1,939.51	10-31-87
W-095425	Allied Chemical Co.	Secs. 4, & 10; E1/2 Sec. 26: T. 18 N., R. 109 W. Sec. 32 T. 19 N., R. 109 W.	2,245.77	1-31-80
W-044875	FMC Corp.	Secs. 2, 4, 6, & 8 T. 18 N., R. 110 W.	2,572.44	10-31-87
W-0111730	Stauffer Chemical Co.	Sec. 12; NW1/4 & SE1/4, E1/2NE1/4, W1/2, S1/2SE1/4 Sec. 22; Secs. 24, & 26 T. 20 N., R. 109 W. Sec. 18 T. 20 N., R. 108 W.	2,497.46	10-31-81
W-0111731	Stauffer Chemical Co.	Secs. 28 & 32, T. 21 N., R. 108 W. Secs 10 & 14 T. 20 N., R. 109 W.	2,560.00	9-31-81
W-0256443	Texasgulf, Inc.	Sec. 26, T. 20 N., R. 111 W. Secs. 2, 10, & 14, T. 19 N., R. 111 W.	2,547.03	7-31-83
E-021612	FMC Corporation	Secs. 22, 26, 24, & 28, T. 19 N., R. 110 W.	2,560.00	
W-053867	FMC Corporation	Secs. 20, 30, 32, & 34 T. 19 N., R. 110 W.	2,556.32	

Table A1-5

NONPRODUCING SODIUM LEASES

Applicant	Lease No.	Legal Description	Approximate Acres In Lease	Expiration Date
Stauffer Chemical Company	W-079420	Sec. 8; E1/2, E1/2W1/2 18; 20; SW1/4 Sec. 22, & 28, T. 20 N., R. 109 W.	2,560.00	10-31-81
FMC Corporation	W-0323406	N1/2 Sec. 18, T. 19 N., R. 110 W.	317.36	11-30-87
FMC Corporation	W-044874	Secs. 10, 12, 14, & 22, T. 18 N., R. 110 W.	2,560.00	1-31-77
FMC Corporation	W-0317634	Sec. 24, T. 18 N., R. 110 W.	640.00	5-31-86
Tenneco Oil Co.	W-081607	Sec. 20, 28, 32; T. 18 N., R. 110 W. Sec. 4, T. 17 N., R. 110 W.	2,565.85	4-15-79
Tenneco	W-0153933	Sec. 26, T. 18 N., R. 110 W.	640.00	9-30-82
Tenneco	W-095423	Sec. 34, T. 18 N., R. 110 W.	640.00	1-31-81
Tenneco	W-0324547	Sec. 30, T. 18 N., R. 109 W.	649.92	7-31-86
Tenneco	O-25383A	Sec. 36, T. 18 N., R. 110 W. (Federal Surface State Minerals)	640.00	4-15-79
Allied Chemical Company	W-095424	Sec. 30, T. 19 N., R. 109 W.	645.60	1-30-80
Allied Chemical Company	E-022957	NE1/4 Sec. 2; Lots 1, 2, 3, 4 W1/2,W1/2E1/2 Sec. 12; E1/2 Sec. 14, W1/2 Sec. 22, & Sec. 24; T. 18 N., R. 109 W.	1,918.73	10-31-77
Allied Chemical Company	E-25387	Sec. 36, T. 18 N., R. 109 W. (Federal Surface State Minerals)	640.00	4-15-79

Table A1-5
(continued)

Applicant	Lease No.	Legal Description	Approximate Acres In Lease	Expiration Date
Allied Chemical Company	W-15764	Sec. 8; Lot 1, N1/2 NE1/4, NE1/4NW1/4, Sec. 18; & Sec. 22, T. 19 N., R. 109 W.	1,411.87	1-31-80
Allied Chemical Company	W-0313060	Secs. 2, 4, 10, & 14, T. 19 N., R. 109 W.	2,561.00	8-31-85
Texasgulf	W-0313077	Sec. 34, T. 20 N., R. 111 W.	661.30	2-28-84
Texasgulf	W-0313075	Secs. 14, 22, & 24, T. 20 N., R. 111 W.	1,921.65	12-31-81
Texasgulf	W-0313076	Sec. 12, T. 20 N., R. 111 W.	641.43	2-28-84
Texasgulf	W-0252727	Secs. 30 & 32, T. 20 N., R. 110 W. Sec. 6, T. 19 N., R. 110 W. Sec. 12, T. 19 N., R. 111 W.	2,523.50	7-31-83
Texasgulf	W-0252726	Secs. 28 & 34, T. 20 N., R. 110 W. Secs. 4 & 8, T. 19 N., R. 110 W.	2,563.67	7-31-84
Olin Corporation	W-0225918	Secs. 22, & 26, T. 16 N., R. 110 W.	1,28.00	10-31-81
Church & Dwight Corporation	W-0225919	Sec. 10, T. 17 N., R. 109 W.	640.00	10-31-81
Olin Corporation	W-0225916	Sec. 4, T. 16 N., R. 109 W. Sec. 34, T. 17 N., R. 109 W.	1,280.00	10-31-81
Olin Corporation	O-69724	W1/2W1/2 Sec. 36, T. 17 N., R. 109 W. (Federal Surface State Minerals)	160.00	11-15-79
Olin Corporation	W-0225917	W1/2 Sec. 2, & W1/2 Sec. 14, T. 16 N., R. 109 W.	591.34	10-31-81
Olin Corporation	W-081577	Secs. 8, 10, 20, & 22, T. 16 N., R. 109 W.	2,560.00	10-31-81
Olin Corporation	W-081578	Secs. 12, 14, & 24, T. 16 N., R. 110 W. Sec. 18, T. 16 N., R. 109 W.	2,532.16	10-31-81
Olin Corporation	W-19724	W1/2W1/2 Sec. 36, T. 17 N., R. 109 W.	160.00	11-15-79
Reynolds	W-0220479	Secs. 8, 18, 20, & 22, T. 20 N., R. 110 W.	2,533.60	11-31-82
John S. Wold & Eugene B. Simons	W-63588	Sec. 3, T. 16 N., R. 108 W. Sec. 26, T. 17 N., R. 108 W.	1,176.96	
Church & Dwight Company	W-73121	Sec. 8 & 18 T. 17 N., R. 109 W.	1,282.93	

Table A1-5
(continued)

Applicant	Lease No.	Legal Description	Approximate Acres In Lease	Expiration Date
Philsdelphis Quartz Corporation	W-057154	Sec. 2, T. 18 N., R. 111 W. S1/2 Sec. 26, & Sec. 34, T. 19 N., R. 111 W.	1,602.16	4-30-78
Philadelphia Qusrtz Corporstion	W-064005	E1/2 Sec. 4, & 10, T. 18 N., R. 111 W.	960.00	6-30-78
Philsdelphia Quartz Corporstion	W-064006	Secs. 12, 14, & 24, T. 18 N., R. 111 W. Sec. 18, T. 18 N., R. 110 W.	2,554.50	6-30-78
Philadelphic Qusrtz Corporstion	W-081608	Sec. 6, T. 17 N., R. 110 W. Sec. 30, T. 18 N., R. 110 W. Secs. 22 & 26, T. 18 N., R. 111 W.	2,556.11	4-15-79
Diamond Shsmrock	W-0309132	Secs. 22 & 24, T. 17 N., R. 108 W.	1,280.00	9-29-86
FMC Corporation	W-053868	Secs. 2 & 12; N1/2, N1/2S1/2 Sec. 10; T. 19 N., R. 110 W. Sec. 6, T. 19 N., R. 109 W.	2416.96	
R. C. Strum	W-086530	Sec. 30, T. 17 N., R. 109 W.	641.07	10-31-81
K. E. Grierson	W-079653	Secs. 26 & 34, T. 17 N., R. 110 W. Secs. 2 & 4, T. 16 N., R. 110 W.	2,412.08	10-31-81
K. E. Grierson	W-079652	Sec. 32, T. 17 N., R. 109 W. Sec. 6, T. 16 N., R. 109 W.	1,172.10	10-31-81
C. G. Skruggs	W-081579	Secs. 8 & 10, T. 16 N., R. 110 W.	1,280.00	10-31-81
Dismond Shsmrock	W-081576	E1/2 Sec. 2; Sec. 12, E1/2 Sec. 14; & Sec. 24; T. 16 N., R. 109 W.	1,869.80	10-31-81

Table A1-6

PENDING SODIUM LEASE APPLICATIONS

Name of Applicant	Lease #	Legal Description	Acres	Date Filed
Stauffer Chemical	W-59890	Sec. 2, T. 20 N., R. 109 W.	316.90	7-05-77
Stauffer Chemical	W-59526	Sec. 30, T. 21 N., R. 108 W.	638.44	5-31-77
Pacific Power & Light	W-56813	Sec. 30, 32, & 34, T. 20 N., R. 109 W.	1,950.55	9-15-76
Pacific Power & Light	W-55684	Sec. 24 & 26, T. 20 N., R. 110 W.	1,280.00	6-07-76
Pacific Power & Light	W-55683	Sec. 28 & N1/2, W1/2SW1/4, SE1/4SW1/4SE1/4, Sec. 34; T. 17 N., R. 108 W.	1,240.00	6-07-76
Church & Dwight Co.	W-67826	Lot 4, S1/2NW1/4, SW1/4, S1/2SE1/4 Sec. 2, 4, 14, & 22, T. 17 N., R. 109 W.	3,840.00	4-05-79
Church & Dwight Co.	W-68614	Sec. 26 & 28 T. 17 N., R. 109 W.		7-02-79
Amax Exploration, Inc.	W-71345	Lots 5, 6, 7, 8, S1/2N1/2, S1/2 Sec. 4; Lots 8, 9, 10, 11, 12, 13, 14, S1/2NE1/4, SE1/4NW1/4, E1/2SW1/4 Sec. 6; Sec. 8; T. 15 N., R. 109 W. Secs. 26 & 28; Lots 5, 6, 7, 8, E1/2, E1/2W1/2 Sec. 30; Secs. 32 & 34; T. 16 N., R. 109 W.	5,072.67	6-06-80
Vulcan Materials Co.	W-74418	Secs. 2 & 12, T. 15 N., R. 110 W. Secs. 28 & 34, T. 16 N., R. 110 W.	2,560.00	2-23-81

Table A1-6
(continued)

Name of Applicant	Lease #	Legal Description	Acres	Date Filed
AMAX Exploration Inc.	W-71820*	Lots 5, 6, 7, 8, S1/2N1/2, S1/2 Sec. 4; Lots 8, 9, 10, 11, 12, 13, 14, S1/2NE1/4 Sec. 6; SE1/4NW1/4, E1/2SW1/4, SE1/4 Sec. 8; T. 15 N., R. 109 W. Secs. 26 & 28; Lots 5, 6, 7, 8, E1/2, E1/2W1/2 Sec. 30; Secs. 32 & 34; T. 16 N., R. 109 W.		7-31-80
Tenneco Oil Co.	W-73292	Secs. 20, 28, & 34, T. 18 N., R. 109 W.		12-8-80
Tenneco Oil Co.	W-73293	Sec. 6, T. 17 N., R. 109 W. Secs 2, 10, & 12, T. 17 N., R. 110 W.		12-8-80
Tenneco Oil Co.	W-73295	Sec. 32, T. 18 N., R. 109 W.		12-8-80
Vulcan Materials Co.	W-74421	Secs. 26, 28, 30, & 32 T. 16 N., R. 109 W.	2,560.00	2-23-81
Vulcan Materials Co.	W-74420	Sec. 30, T. 17 N., R. 108 W. Secs. 22, 24, & 26 T. 17 N., R. 109 W.	2,560.00	2-23-81
Vulcan Materials Co.	W-74419	Secs. 4, 6, & 8, T. 15 N., R. 109 W. Sec. 34, T. 16 N., R. 109 W.		

*Amended W-71345

Table A7-2

HISTORIC SITES IN THE SODIUM DEVELOPMENT AREA

	Site	County	Type	Condition
Period I--Fur Trade and Exploration (1812-1841)				
Known or Potential Sites	Bridger/Fraeb Post	Sweetwater	Locale/ building(?)	Post gone
Period II--Acquisition, Emigration, Transportation, Communication, and Early Military History (1842-1869)				
National Register Sites	Granger Stage Station	Sweetwater	Building	To be restored
Wyoming Historic Inventory (Eligible for Nomination)	Lone Tree Stage Station	Sweetwater	Building	Deteriorated
	Oregon Trail*	Sweetwater	Trail	Variable
	Overland Trail	Sweetwater	Trail	Variable
	Church Buttes Pony Express Station	Uinta	Structure	Deteriorated
	Cherokee Trail	Sweetwater	Trail	Variable
	Mormon Pioneer Trail*	Sweetwater	Trail	Variable
Period III--Settlement and Development Period (1869-1925)	Martins Pony Express Station	Sweetwater	Structure	Unknown
Wyoming Historic Inventory (Eligible for Nomination)	Bryan Townsite	Sweetwater	Structure	Deteriorated
Known and Potential Sites				
	Horseshoe Bend of Green River	Sweetwater	Old ranch	Unknown
	Hawley Ranch	Sweetwater	Structure	Unknown
	Green River Mercantile	Sweetwater	Building	--

*Oregon Trail and Mormon Pioneer Trail were designated on November 10, 1978, as National Historic Trails.

Table A7-3

RECREATION SENSITIVITY

	Esthetic Factors			Natural Qualities			Solitude/Privacy		
	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low
Recreation Vehicles		X				X		X	
Hunting-Big Game		X			X			X	
Hunting-Waterfowl		X			X				X
Hunting-Other			X			X		X	
Fishing	X				X			X	
Camping	X					X		X	
Picnic	X				X			X	
Hiking/Backpacking	X			X			X		
Rock Climbing		X		X				X	
Horseback Riding		X			X			X	
Rock Collecting		X			X			X	
Other Collecting		X			X			X	
Boating-Power		X		X					X
Boating-Sail	X			X				X	
Boating-Canoe	X			X			X		
Boating-Floating	X			X				X	
Swimming		X			X			X	
Snowmobile			X		X			X	
Skiing-Downhill			X			X			X
Skiing-Cross Country		X			X		X		
Snowplay		X				X			X
Wilderness	X			X			X		

MITIGATING MEASURES AND MONITORING

COMMITTED MITIGATION

Committed mitigation, or mitigating measures that are part of the proposed action, consists of the limited surface occupancy criteria and the proposed prospecting permit stipulations that would be required in addition to existing prospecting permit conditions (page A-22, Volume 1) in Form 3510.1

Limited Surface Occupancy Criteria

The criteria would be made provisions of the lease or lease renewal. Judicious application of the criteria would be at the discretion of the BLM Authorized Officer (AO) in considering site-specific proposals for the development of a particular lease. The boundaries of the individual criteria areas within the trona deposition area and sodium carbonate brine area are shown on a detailed map available for review in the Rock Springs District Office. The criteria may also be applicable to future development on public lands elsewhere in the District.

Authorizing development on private or state land would be at the discretion of the respective landowners.

Companies may wish to purchase their plant sites because of long-term plant life. Reclamation would likely be the same because of State laws. However, the processing of ROWs would be reduced. The time involved in the process and filing fees and designs would not be a factor.

The limited surface occupancy criteria protect those areas where surface occupancy could conflict with other resource values. In cases where structures and developments are limited but not excluded, the limitations may affect the size, height, coloring, specific site location, season of use, and other aspects of surface occupancy to assure compatibility with other resource values. Structures such as hoist houses, processing plants, steam plants, ore and coal stockpiles, loadout, storage tanks, office/storage buildings, tailings, con tainment areas, etc., usually would not meet the criteria. Resource values to be protected include sage grouse habitat; historic trails and sites; water qual ity, visual, and recreation resources associated with the Flaming Gorge Re servoir and the Blacks Fork, Green, and Hams Fork Rivers; wilderness values; vegetation; big game crucial wintering areas; high-value livestock range; and public safety.

The limited surface occupancy criteria are:

1. Limit surface occupancy within one-fourth mile of any identified sage grouse strutting grounds (lek; see Glossary), and no disturbance within an additional one-fourth mile of the lek center should occur from March 1 to May 15 unless authorized by the AO.
2. Limit surface occupancy within one-fourth mile of either side of various historic trails and sites.
3. Limit surface occupancy within one-half mile of either side of the Flaming Gorge Reservoir and the Green, Blacks Fork, and Hams Fork Rivers.
4. Limit surface occupancy in those areas within the foreground/mid dleground (see Glossary) from the Flaming Gorge operating pool (6,040 feet MSL) for the purpose of protecting visual and recreation values of the Flaming Gorge National Recreation Area (NRA). Developments such as those listed in the "Dis trict Trona Analysis and Stipulations Staff Report" (BLM, December 30, 1980), available for public review at the BLM Rock Springs District Office, would be excluded from that area. Developments that would have intrinsically little visual impact could be approved. The key principle is whether the structure or development would dominate the foreground-middleground (See Glossary). This would be consistent with the Forest Service's "partial retention" policy for the NRA.
5. No surface occupancy or other surface disturbing activities that would impair Wilderness Study Areas' suitability. (Refer to Interim Management Policy and Guidelines, issued by the U.S. Department of the Interior, BLM, December 1979 and Wilderness Management Policy, Department of the Interior, BLM, September 1981.),
6. In big game crucial wintering areas, surface occupancy may be limited by the location and/or season of use. In cases where loss of big game crucial winter habitat is proposed because of developments such as roads, railroads, powerlines, communication lines, ventilation shafts, mine entrances, and ponds; the BLM Authorized Officer (AO) would require improvement projects that would offset habitat losses. The type of projects would be considered on a case-by- case basis and could include seeding, prescribed burning, guzzlers (see Glossary) and water developments, plantings, etc.
7. Surface occupancy may be limited by location and/or season of use in certain lambing areas and/or high-value livestock grazing areas. The

AO would require improvement projects where the loss of rangeland is proposed.

8. Surface occupancy may be limited where activities could cause heavy fog conditions that could pose public safety hazards. The BLM would allow new mine development and allow expansion of plants on Federal land within surface occupancy areas. The operation of existing mines, milling and refining methods, surface structures, waste disposal, and abandonment/reclamation are described in Appendix 3, Volume 1.
9. Surface occupancy by visible operating facilities in the White Moun tain Wild Horse Management area should not interfere with the special viewing turn out to be established along Highway 191. Developments in this area would distract from the public view of the horses.

Proposed Prospecting Permit Stipulations

1. The permittee would avoid any operation when the ground is muddy and/or wet. The AO could prohibit exploration, drilling, or other activities during wet or heavy snow periods.
2. Whenever possible, a portable mud pit would be used when drilling with fluids.
3. No blading or other dirt work would be allowed without written permission from the AO.
4. There would be no burying of garbage and/or trash. All trash and garbage would be hauled to an approved disposal site.
5. Access across public lands to the permit area would rquire authorization through the issuance of a Temporary Use Permit (TUP), or Right-of-Way (ROW).
6. Any vegetation removed during blading or construction would be spread back over the disturbed area after seeding as cover for the seeded area.
7. At least 6 inches of topsoil or soil material would be stockpiled to be spread back over disturbed areas after completion of operations, unless otherwise specified by the AO.
8. Prior approval from the AO would be needed for the use of water from developed stockwater sources.
9. All prospecting activities, including but not limited to, drilling operations, water hauling, various vehicular traffic, etc., would be resricted to the permitted area and/or the area authorized in the TUP or ROW.
10. All areas disturbed would be rehabilitated to the satisfaction of the AO.
11. A cultural resource inventory would be conducted pursuant to Executive Order 11593 and BLM Instruction Memorandum WY-80-523 before any surface disturbing activity is allowed. The inventory would identify all cultural resources present within each proposed permit area, and would be conducted at the company's expense.
12. If National Register quality sites are found during the cultural resource inventory, Section 106 compliance procedures would be conducted and appropriate mitigation would be applied. Salvaging or testing of non-National Register sites would be conducted pending the approval of the BLM AO.
13. Drill Hole Plugging Standards: All drill holes would be plugged in accordance with the State of Wyoming Land Quality Rules and Regulations in particular W.S. 35-11-404.
14. No activity would take place in big game crucial wintering habitat between November 15 and March 15 without prior approval of the AO.
15. In order to protect sage grouse strutting and nesting habitat, prospecting would not be allowed between March 1 and June 15 within 1¾ miles of any sage grouse strutting ground (lek center).
16. Surface-disturbing activities would not be allowed in identified lambing areas between May 1 and June 10 unless authorized by the AO.
17. The BLM, Minerals Management Service, and State of Wyoming Engineer's Office would be notified if black water or flowing artesian wells were encountered during drilling operations.
18. Surface disturbance would not be allowed within one-quarter mile of any well-preserved ruts of the various historic trails.
19. Prospecting occurring within any wilderness or wilderness inventory unit must comply with all laws, regulations, and the interim wilderness management policy applicable to the protection of the wilderness characteristics of the area.
20. All drainages would be kept open to allow free water movement.
21. After operations are completed, any new roads or pads constructed would be rehabilitated. All berms and borrow ditches would be smoothed to conform to the surrounding terrain.
22. All existing roads that are to be used would be graded only to prevent rutting and to fill in ruts. Any additional blading or widening of existing

access roads would be allowed only with the permission from the AO.

23. Road drainage crossings would be designed so they would not cause siltation or accumulation of debris in the drainage crossing, nor would the drainages be blocked by the road bed. Whenever possible, streambank crossings on major drainages should be constructed with the bank feathered back at a 45° horizontal angle or less to avoid siltation.

24. Construction activity would not take place within one mile of identified raptor nests during the raptor nesting period of March 1 to June 30 unless allowed by the AO. In addition, golden eagle nest sites should not be disturbed anytime during the year.

OTHER PROPOSED MITIGATION

The mitigating measures which follow are supplemental to the existing and proposed standard stipulations provided with and contained in prospecting permits (Form 3510-1); sodium leases (Form 3520-3); and rights-of-way (for railroads, pole powerlines and telephone lines, pipelines and buried cables, and roads and highways, under Wyoming State Office Instruction Memorandum WY-80-155 and appropriate Code of Federal Regulations standards). These forms are contained in Appendix 2. Additional site specific stipulations may be applied to individual permits. The Bureau recognizes that some of these measures overlap with what is already required by various other agencies (i.e., Wyoming Department of Environmental Quality (DEQ), Environmental Protection Agency (EPA), etc). Nevertheless, for the purposes of analysis and the sake of environmentally sound management of public lands, they are listed here. Revisions have been made since Volume 1, based on Bureau and public review comments.

The purpose of this section is to develop types of mitigating measures that could be required to protect resource values and to minimize and reduce the impacts of the alternatives including the proposed action.

Air Quality

1. Watering or other approved dust control methods may be required during the construction of plant sites, rights-of-way, tailings ponds, and during rehabilitation operatins when dust and resulting air pollution exceeds standards set by the Wyoming DEQ.

2. To control blowing dust from dry portions of the tailings and containment pond areas especially during the summer months, a soil binder should be spread on the dry exposed surfaces.

3. Use of temporary or non-paved road surfaces during heavy vehicular traffic periods should be water sprayed or covered with a dust binding agent to reduce dust and reduce visual impacts.

4. Soil stockpiles from tailings ponds and plant sites with wind erodibility potential should be graded on all sides to a maximum slope of 4:1 before being revegetated. These stockpiles should be seeded as soon as possible to provide soil stabilization. Other wind erosion precautions such as snow fences, mulching, mixing of topsoils, or covering stockpiles with soils of low wind erosin properties should be done where deemed necessary.

5. Stockpiles of trona and coal should be located either near natural or manmade windbreaks.

6. Permanent access roads to plant sites, mine shafts, parking lots, etc., should be paved to eliminate dust from vehicular movement.

Topography

1. No road, pipeline, buried cable, or other major surface disturbing activity should be allowed on slopes greater than 20% unless the Authorized Officer (AO) makes exception.

Geology and Mineral Resources

1. Existing sand and gravel pits should be utilized whenever the AO determines it feasible, before new sites are to be excavated.

Paleontology

1. If paleontological resources are discoverd in the course of construction or excavation, the activity should cease and the BLM AO notified. The company should then provide a qualified individual approved by the BLM to collect and remove the fossils.

Soils

1. All disturbed areas should be recontoured to blend with the natural topography, topsoiled, and seeded as soon as possible after construction.
2. Upon abandonment of plant and mine sites, reclamation as listed in No. 1 above should be commenced immediately.
3. Site grading should be carried out only where absolutely required, as determined by the AO. Topsoil stockpiling should be done for all suitable soils as determined by the authorized officer.
4. Construction of roads with frozen earth material mixed with snow and ice should not be allowed, unless permitted by the AO, because it would result in unstable roads causing movement of the roads during thaws. The resulting sediment of such movement would impact adjacent watersheds, riparian areas, and streams.
5. Loading facilities and associated transportation routes should be periodically cleared of debris.
6. Coarse textured soils should be used for possible plant and tailings ponds locations.
7. All solid waste (trash and garbage) material generated during construction and operation should be collected and disposed of in an authorized sanitary landfill.
8. All embankment fill material for reservoir dams should come from within th reservoir areas and no borrow pits should be required unless special materials are called for, such as clay for filling a core trench. If a separate fill area is utilized, after the fill is removed the area should be stabilized.
9. A soil conservation plan tailored to each mine site should be developed an approved by the BLM AO prior to construction. The soil conservation plan will include:

   a. Identify on map of area
   - Surface disturbance during construction
   - Location of topsoil and amount
   - Sources and amount of fill material
   - Soil test sites for monitoring
   - Potential soil erosion areas

   b. Soil erosion control methods with potential site locations as identified on map of area

   c. Revegetation of disturbed areas
   - Methods
   - Materials
   - Time frames

   d. Soil fertility program to meet revegetation needs of disturbed areas
10. Waterbars should be installed on disturbed and rehabilitated areas to prevent erosion. General guidelines for installation of waterbreaks are: less than 2% grade, 200-fooot interval; 2-4% grade, 100-foot interval; 4-5 grade, 50-foot interval. A certain degree of latitude is allowed in the waterbreak interval spacing. Unstable soils may require a closer interval spacing, whereas the interval spacing may be greater on very stable soils or rock outcroppings. A conservative (close) interval spacing is the general recommendation. Waterbreaks are generally constructed on the contour and empty on the downhill side of the cleared area. They are to be constructed to begin in vegetation on the uphill side and feather out into vegetation on the downhill side.
11. There should be no blocking of drainages with vegetation or soil that has been removed.
12. Centerline survey and construction designs requested by the BLM AO should be approved by the AO prior to road construction.
13. Pipeline trenches should be maintained in order to correct settlement and erosion. Pipeline trenches should be compacted during backfilling. All pipelines should be buried where they cross existing roads.
14. Topsoil or soil material should be stripped from permanent access roads an railroad routes, and should be distributed along the cuts and fills and backslopes and should be seeded.
15. Soils contaminated by accidental or operational spills should be reclaimed through removal and disposal at an authorized dump site.

Water Resources

State and Federal regulations currently in existence which provide measures designed to protect water quality should be strictly adhered to in any development of the sodium mineral area.

1. Discharge of water on public lands would not be permitted without permits from DEQ and authorization from the U.S. Geological Survey (GS) and the BLM.
2. Use of existing roads to streams, rivers, or reservoirs would be used whenever possible to mini-

mize disturbance, channelization of runoff and thus protecting water quality.

3. Plant site should be designed for "zero discharge concept" through the use of containment ponds.

4. Water-bearing formations with sufficient quality and potential for beneficial use should be protected.

5. It should be demonstrated that an area for a proposed tailings pond is or would be made impervious to seepage of tailings, containment, sewage, etc. ponds.

6. Tailings ponds should be designed to withstand two consecutive 100-year floods. This includes the use of diversion canals or ditches to intercept natural runoff and divert drainages below tailings pond area.

7. A contingency plan for tailings ponds failure should be prepared for BLM and DEQ approval.

8. During shaft sinking, any ground water encountered should be grouted off and sealed.

9. A premining plan should be submitted to the BLM that addresses the hydraulic characteristic of aquifers that may be affected by mining, determine the quantity and quality of ground water to be dewatered at various stages of mining, evaluate impacts of the quantity and quality of adjacent water resources and water rights due to mining activities or dewatering.

10. Proper size culverts with appropriate energy dissipation devices as necessary (able to handle at least a 10-year flood event) would be installed at each drainage crossing with a watershed area greater than 10 square miles. A 10-year flood event would generally assure that the culvert installed would be capable of handling the volume of flow without being washed out. This size storm event could likely occur at least once during the life of an access road. The company would submit for BLM's approval the culvert size and dissipation device design prior to installation. The minimum size culvert installed should be 18 inches.

11. The company or its operator would indicate in their development plans locations of drainage crossings along with the type of structure (culvert, arch bridge, etc.) proposed to be approved by the BLM.

12. Temporary stream stability structures (e.g., gabions, weirs, etc.) would be required where access roads cross stream channels or parallel steep cutbanks and fill slopes for silt retention as determined on a case-by-case basis. Cribbing or retaining structures on constructed slopes in unstable soil steeper than 2 to 1 may also be required unless otherwise authorized by the BLM.

13. Any plant, mill, tailings ponds, and sewage lagoons should be at least one-half to one mile from a perennial water body.

Vegetation

1. All disturbed areas not to be utilized should be rehabilitated to the satisfaction and specifications of the AO.

2. Threatened and endangered species (T&E) clearances are necessary for all areas of surface disturbance.

3. Clearing of vegetation within pipeline, powerline, and communication line ROW would be limited to that area absolutely necessary for safe operation of equipment and to permit construction activities. This would reduce impacts to soil and vegetation. Driving over vegetation would be permitted. This measure would also reduce the size of the area requiring reclamation work following construction.

4. Construction of roads, pipelines, powerlines, and communication lines may be restricted between the general period of November 15 and March 1 as determined by the AO, depending on weather and soil moisture conditions to minimize total vegetation destruction and soil disturbance.

5. Tailings ponds reclamation experiments should be continued.

6. The following seeding stipulation should be utilized. The operator is responsible for establishing an acceptable stand of vegetation. The seed mix should be based on pure live seed.

   Seed should be planted after September 1 and prior to ground frost; or seed should be planted after the frost has left and before May 15. Fall seeding is best. All seed must be drilled on the contour at a depth of ¼ to ½ inch. Slopes too steep or rocky for machinery can be broadcast and the seed hand raked into the soil. When broadcasting the seed, the rate per acre should be doubled.

   If operations are completed in the spring, the rehabilitated areas would be seeded with 15 lbs/acre oats and/or barley. The following fall the area would then be mowed and interseeded with the above seed mixture.

Wildlife

1. Threatened and endangered wildlife species clearance on public lands would be required before any surface-disturbing activities. This would generally include a survey conducted by the BLM to determine if a "may affect" situation exists. If so, Section 7 consultation will be initiated with th U.S. Fish and Wildlife Service (Endangered Species Act).
2. All prairie dog towns that would be affected by construction activities must be surveyed for black-footed ferrets per BLM Rock Springs District Office Instruction Memorandum WY-04-80-59 dated September 19, 1980. Destruction of prairie dog towns should be avoided.
3. No construction activity should be allowed within one mile of identified raptor nests during raptor nesting period of March 1 through June 30. In addition golden eagle nests sites should not be disturbed any time during the year.
4. To offset the loss of big game crucial winter habitat that would be taken out of production for long periods, habitat improvement projects in the area would be required as specified by BLM. Types of projects that would be considered on a case-by-case basis are plowing and seeding, prescribed burning, guzzlers/water developments, etc.
5. All areas that would pose hazards to wildlife or domestic grazing species would be fenced. Such areas include plant site, tailings ponds, containment ponds, primary and secondary sewage lagoons, etc. Fencing standards should be approved by the BLM.
6. To diminish the possibility of migratory waterfowl use of tailings ponds, the most recognized method(s) of hazing, harassing, or distracting the bird should be employed. Records should be kept on the disposition of all wildlife involved in tailings ponds incidents.
7. Tailings ponds should be patrolled, and migratory birds that do use the tailings pond and are rendered flightless should be rehabilitated and released through the use of halfway houses.
8. No major surface-disturbing activities should take place within one-fourth mile of any established sage grouse strutting grounds (lek center). No surface disturbance within an additional 1¾ miles of the lek center may occur during the period of March 1 to June 15 unless authorized by the AO.

Aquatic Wildlife

1. Water should be taken from the Green River at or as close to the Flaming Gorge Reservoir as possible to maintain water levels for fisheries.
2. Funding support for the Wyoming Game and Fish Department for instream boulder placements to improve trout cover during low flow periods should be considered.

Cultural Resources

1. A cultural inventory is required prior to any surface disturbance.
2. Prior clearance must be given when previously identified areas are to be entered.
3. Alluvium deposit areas would be moitored by the archeologist during the actual surface disturbance if required by the AO.
4. A one-fourth mile buffer zone would be maintained around all identified sites unless authorization is received from the AO.
5. Crossing of historic trails would be limited to areas where trails are not well defined, as determined by the AO. Trails should be crossed in a perpendicular fashion and no paralleling within one-fourth mile of trail would be allowed.

Visual Resources

1. At the discretion of the AO visible structures should be painted with natural colors to blend with the landscape (pump houses on water lines, storage tanks, etc.). Appropriate colors would be selected by the AO.
2. All development (roads, drill pads, etc.) should be consistent with each area's existing visual contrast rating classification. Development which would exceed the visual contrast rating classification should be either modified or the area should be reclaimed to be consistent with the visual classification.
3. Developments should be designed to meet VRM Class standards. Selected removal of junniper and other timber types and avoidance of regular patterns in development should be utilized to reduce the visual impact.

Livestock

1. No utilization of developed stock watering sources should be allowed without prior approval of AO.
2. To offset the loss of livestock grazing range that would be out of production for long periods, range improvement projects in the area would be required as specified by the BLM AO.

Land Uses

Ancillary facilities such as roads, powerlines, and pipelines should follow existing corridors of disturbance whenever practicable.

MONITORING

Because the impacts of soda ash "fallout" are unknown, mitigation cannot be proposed at this time. A monitoring program should be established to gather the information needed to assess the impacts and determine the necessary, if any, mitigation.

The monitoring system should be designed and implemented by an interdisciplinary staff including, but not limited to, a botanist, soil scientist, and hydrologist. This type of staff would be necessary since such a monitoring system would include gathering data on water quality, air quality, soils, and vegetation.

The basic requirements of the study would be as follows:

a. Data collection each year for 15-20 years.

b. Permanent vegetation transects should be established 20-30 miles around th plant sites and particularly downwind from the plants. Control sites would be located upwind. Each plot would be monitored annually for species diversity, production, and cover. Soil tests would also be conducted.

c. Particulate samplers should be placed at various distances downwind of the plants to provide supplemental information to that supplied by the companies. Sampling for fluorides should be included.

d. Runoff installations should be constructed and monitored in an area downwind 5-10 miles to support watershed, soils, and vegetation studies.

e. A selective number of drainages in the trona region should be monitored to determine if any significant change in local water quality is taking place

f. Companies should conduct a complete total suspended particulates (TSP) analysis at least four times a year.

g. Streams directly downwind of the plants should be sampled at least four times a year.

h. In solution mining areas, a three-dimensional monitoring well net down gradient from the mine area should be etablished. Wells should monitor above and below the mine zone and cross the hydrologic gradient laterally. This system should be determined from the hydrogeologic study.

i. Soil tests such as those listed below, should be conducted for trona fallout accumulation on a 360° survey around each of the plants on a semiannual basis. All soil test results should be furnished to the AO. Tests should be run at ¼, ½, 1 and 1½ mile intervals.

   1. Saturated paste pH.
   2. Electrical conductivity.
   3. 1:5 pH.
   4. Soluble cations (Ca, Mg, Na, K).
   5. Soluble anions (Cl, HCO_3, CO_3).
   6. Sulfate.
   7. Cation Exchange Capacity (C.E.C.).
   8. Extractable cations (Ca, Mg, Na, K).
   9. Nitrogen.
   10. Organic carbon-organic matter.
   11. Calcium carbonate equivalent.
   12. Gypsum.
   13. Available phosphorus
   14. Mechanical analysis.
   15. Bulk density.
   16. ⅓ atmosphere moisture content.

j. Companies should continue to experiment with the reclamation of the tailings ponds in order to find a way to restore these areas to productive portions of the ecosystem.

k. An acceptable method of monitoring seepage of tailings ponds for both ground and surface water would be required. Test wells would be an acceptable method. Information would be sent quarterly to the BLM District Office.

l. Identification of inversions or stable atmospheric conditions within the sodium development area should be made and recorded.

CHAPTER IV

CONSULTATION AND COORDINATION

TEAM ORGANIZATION

This volume of the environmental assessment (EA) was prepared by the Team Leader with technical guidance and input from the special assistance team. Table IV-1 lists the preparers of this volume.

COORDINATION IN PREPARATION OF THE PROPOSED ACTION

A sodium workshop was held February 28, 1980, in the Rock Springs District Office. The workshop was attended by representatives of the local trona industry, Rocky Mountain Energy Company, and Geological Survey (formerly Minerals Management Service). The input obtained during this meeting was used to formulate the Management Framework Plan recommendations (MFP-2). The proposed action addressed in this EA was taken directly from the MFP documents (BLM 1981a, 1981b, 1981c).

The MFP-2 recommendations for sodium were among those presented by BLM during a public meeting on December 12, 1980, at Western Wyoming College in Rock Springs. Comments received at the meeting and during the subsequent comment period were considered in the formulation of the MFP-3 land use decisions for sodium mineral development.

The MFP recommendations were discussed on January 8, 1981, by the BLM Rock Springs District Advisory Council during its meeting in the Mountain Fuel Building, Rock Springs. In addition, the Bureau has received comments on the MFP recommendations from Dick Randall of the Defenders of Wildlife, the Wyoming Game and Fish Department, and Thomas Woodward, a Casper geologist with interests in sodium development.

A Trona Analysis and Stipulations Staff Report was prepared in December 1980 for the purpose of protecting other resources and resolving conflicts identified through the planning process between sodium mineral development and other resource values.

PUBLIC CONSULTATION AND COORDINATION

During preparation of the EA the following agencies were consulted: Bureau of Mines, Minerals Management Service (Geological Survey), Forest Service, Fish and Wildlife Service, Wyoming Department of Administration and Fiscal Control, Wyoming Department of Economic Planning and Development (DEPAD), Wyoming Department of Environmental Quality, Wyoming Department of Revenue and Taxation, Wyoming Game and Fish Department, Wyoming State Highway Department, Wyoming State Mine Inspector, Wyoming Water Development Commission, Sweetwater County Planning Office, the Lincoln-Uinta Association of Governments, and the Southwestern Wyoming Industrial Association. Various individuals connected with the soda ash industry and private landowners were consulted throughout the preparation of this EA.

Dennis Kostick, physical scientist for the Bureau of Mines' Washington, D.C., has met with BLM representatives several times in 1980 and 1981 to discuss sodium production and necessary BLM actions to ensure continued soda ash production. He provided data used throughout this EA to assist in determining markets and potential production.

The MMS District Mining Supervisor's Office, Rock Springs, Wyoming, was consulted regarding the Known Sodium Leasing Area (KSLA) boundaries and prospecting in the sodium development area. MMS in Rock Springs was further consulted (pers. comm. 1982) regarding possible sodium mineral development and potential management guidelines for that development. Geological Survey in Laramie, Wyoming was consulted regarding particulate emission analysis.

Personnel from the Ashley National Forest, Intermountain Regional Office, and the Zone Geologist met with BLM on October 7, 1980, in BLM's Rock Springs District Office. Their concerns regarding possible impacts to the Flaming Gorge National Recreation Area were discussed.

The Fish and Wildlife Service was contacted to obtain information regarding waterfowl losses due to tailings ponds, waterfowl populations, and possible impacts to the Seedskadee National Wildlife Refuge. The refuge manager (pers. comm., Rodri-

Table IV-1

LIST OF PREPARERS

Name	EA Assignment	Position/Expertise	Education	Experience
Ronald C. Herdt	Team Leader	District Technical Writer-Editor	B.A. Secondary Education, University of Northern Colorado	5 years - BLM; 6 years - University of Colorado
Bonnie Wright	Lead Word Processing	AMText-425 Operator/Mag Card II Typist	2 years - Western Wyoming College	1 1/2 years - BLM
Edward McTaggart	Wyoming State Office Ea Coordinator	Wyoming State Office Environmental Coordinator	B.S. Forest Recreation, Colorado State University	17 years - BLM
Andrew Tarshis	Wyoming State Office Technical Coordinator	Geologist, State Office Division of Reaources	B.S. Geology, Stanford University; 5 years-Graduate School, University of California, Santa Cruz	6 years- BLM
Ann B. Aldrich	Special Assistance Team	District Botanist	B.S. Botany, University of Michigan	2 1/2 years - BLM
Bruce W. Baker	Special Assistance Team	District Wildlife Management Biologist	B.A Biology, California State University, Northridge; M.S. Wildlife Management, Humboldt State University; PhD. Wildlife Ecology, Texas A&M	2 1/2 years - BLM
Charles R. (Bob) Crockett	Special Assistance Team	District Range Specialist	B.S. Agriculture, University of Arizona	12 1/2 years - BLM
Renee Dana	Special Assistance Team	District Environmental Coordinator	B.S. Range Management, University of Wyomlng	7 1/2 years - BLM
Dean A. Decker	Special Assistance Team	District Archeologiat	B.A. and M.A. Anthropology, University of California, Los Angeles	2 years - BLM 1 1/2 years - BlA
Sally Haverly	Special Assistance Team (Area Coordination)	Big Sandy Resource Area Realty Specialist	3 years -University of Wisconsin, lowa State University, Univeraity of Alaska	5 years - BLM 23 1/2 years-Air Force
Gary McNaughton	Special Aasistance Team	Kemmerer Reaource Area Geologist	B.S. Geology, Deniaon University	3 1/2 years - BLM 1 year - USGS
John S. Young	Special Asaistance Team	Regional Economist	B.S. Animal Science and M.S. Agricultural Systems, Colorado State University	1 year - BLM 1 1/2 years - CSU

guez 1981) was consulted concerning refuge boundaries.

A meeting was held with Wyoming Game and Fish Department's representatives September 24, 1980, at BLM's Rock Springs District Office. The purpose of the meeting was to identify the Wyoming Game and Fish Department's concerns with sodium mineral development and to identify population numbers of affected wildlife, particularly waterfowl. BLM also discussed waterfowl populations with the Department's waterfowl biologist, Leonard Serdiux of Lander.

Department representatives at the September 1980 meeting noted that many antelope had been killed by traffic in the area between Interstate 80 and east of the Blacks Fork, and suggested that as few miles of new road as possible should be allowed in the area west of the Green River. They also discussed waterfowl losses in tailings ponds, especially those owing to fall weather conditions in the northern part of the KSLA, and their concerns related to fisheries habitat in the Green River. They said they would prefer a central facility for taking water from the Green River as close to the Flaming Gorge Reservoir as possible to protect Class I fisheries in the stream. The Department suggested keeping processing plants concentrated in the existing site area, and also noted that reestablishment of native browse species disturbed in any action would take a long time.

The Wyoming Department of Environmental Quality was contacted regarding possible impacts on air and water quality. DEPAD, the State Department of Administration, and the Ad Valorem Tax Division of the State Department of Revenue and Taxation provided socioeconomic data. The Wyoming Water Development Commission provided data concerning water use in the Green River Basin.

BLM requested and received socioeconomic input from various city, county, and state officials and used this information for the socioeconomic sections of this EA. Southwestern Wyoming Industrial Association and various soda ash company representatives also provided data.

PUBLIC PARTICIPATION

On August 26, 1980, a news release was sent to all local and regional media representatives informing the public of the sodium EA development and requesting their input. A second news release was sent in April 1981, also requesting public input.

A letter was sent on August 29, 1980, to approximately 500 individuals thought to have an interest in the area; i.e., environmental groups, government agencies (local, State, and Federal), public land users, private landowners, and others. Their comments and input were requested. BLM received about 50 replies to this letter requesting copies of the draft EA. Some provided comments, mostly concerns about the impacts of sodium development on wildlife and air quality.

Public Review of the Draft

The draft environmental assessment (Volume 1 of this EA) was made available for public review in September 1981. The draft's availability was announced in news releses to media throughout the Rocky Mountain region. In addition to those agencies, firms, organizations, and individuals listed in Volume 1 (pages 129-130); copies were mailed to those parties requesting the draft. Copies of the EA were also made available for public review in area libraries and BLM district and resource area offices.

Owing to difficulties in delivering the draft to those wishing to make comments, the comment period was extended twice. Individuals and organizations offering comments on the draft EA are listed in Table IV-2. Comment letters are reproduced in Appendix 9.

RESPONSES TO COMMENTS

Only substantive comments have been addressed. For full text, see Appendix 9. Identification letter refers to commentators as listed in Table IV-2.

Commentator A

Comment No. 1: On page 86 mention is made of the "caustic" nature of trona tailings. Trona and related compounds are alkaline in nature (CO_3 = ph 10.5) not caustic (OH^- = ph 14).

Response: Text has been revised. See Revisions section of this volume.

Comment No. 2: There is no "cyanide" used in the processing of trona and there is no "fluoride" released which would harm anything. The fluoride present in the final product from both the sesquicarbonate and monohydrate processes is less than

Table IV-2

RECORD OF PUBLIC COMMENT ON SODIUM DRAFT EA

Identification Letter	Commentator	Representing	Date Received
A	W. R. Frint, Green River	Self	9/17/81
B	Mosley, Wells, and Spence, P.C., Denver, Colorado	Several holders of sodium prospecting permits	9/22/81
C	Dwight C. Minton, Piscataway, N.J.	Church and Dwight Co., Inc.	9/28/81
D	L.H.E. Weyher, Green River	Tenneco Oil Co.	9/28/81
E (1)	Governor Ed Herschler	State of Wyoming	9/30/81
E (2)	H. Bruce Marker	Game and Fish Department	9/30/81
E (3)	Louis E. Allen	State Engineer's Office	9/30/81
E (4)	William P. King, P.E.	State Highway Department	9/30/81
E (5)	Carl E. Johnson	Commissioner of Public Lands	9/30/81
E (6)	Collin Fallat	State Department of Agriculture	9/30/81
E (7)	Dan Hausel	Geological Survey of Wyoming	9/30/81
F	R. W. Knostman, Denver	Anaconda Copper Company	10/01/81
G	Clark M. Bolser, Broomfield, Colorado	Rocky Mountain Energy	10/02/81
H	Wes Nash, Green River	FMC	10/08/81
I	Melvin E. Clark, Birmingham, Alabama	Vulcan Materials Company	10/19/81
J	Dick Randall, Rock Springs	Defenders of Wildlife	10/23/81
K	Dwayne E. Hull, Casper	U.S. Geological Survey	11/25/81

10 ppm and is in the form of sodium fluoride. There is no hydrofluoride formed and any emissions from the plant would result in less fluorine in the soil than occurs naturally as is stated on p. 86 "554 ppm fluorine is twice the average for many soils."

Response: The reference to cyanide has been deleted. See Revisions section of this volume. Any fluorine emissions from the plant would be in addition to that occurring in the soil downwind of a plant, and the effect of those emissions on vegetation is not known at this time.

Comment No. 3: There are also no "long-chain hydroxides" used in any processing, including solution mining solvent.

Response: The Bureau has not identified any "long-chain hydroxides" in the processing procedure.

Comment No. 4: On p. 90 it implies that any waterfowl spending one hour on the tailings pond is rendered incapable of flying. This is not true. Throughout most of the year birds can be on the tailings ponds for long periods (at least 24 hours) without harm. Only for a few days in the fall when the temperature is dropping rapidly will any crystallization occur in the ponds. It is therefore a rare and infrequent occasion when one hour on a tailings pond will render a bird incapable of flying.

Response: The Wyoming Game and Fish Department notes (pers. comm. 1980) that decahydrates crystals begin to form on anything that gets into the water within minutes after contact under certain weather conditions, forming crystals in the feathers of birds. The Bureau agrees that such weather conditions vary from year to year and that such conditions generally occur from October 1 to November 30; however, losses have been recorded at other times of the year according to Fish and Wildlife Service records.

Comment No. 5: On p. 94 it states that "Livestock losses could also result from leaving tailings ponds, mud pits, or brine pits unfenced". I have observed unfenced trona tailing ponds and mud pits for over 25 years and have never observed livestock losses from such activities. Animals do not drink the solution nor do they get stuck in the mud and drown.

Response: The Bureau has data to support or refute this claim.

Comment No. 6: The mitigating measures under wildlife, wildhorses and livestock recommends fencing of tailings ponds and pit. This is completely unnecessary.

Response: See response to Comment No. 5.

Comment No. 7: "No surface disturbance would be allowed within one-fourth mile of well preserved wagon ruts". This would be fine if the BLM would identify and fence off such locations...

Response: Well preserved wagon ruts would be identified during archeological surveys preceding surface disturbance. Whether or not these locations would require fencing to preserve their character would be determined on a site-specific basis.

Comment No. 8: "All ore or product shipment should be done in covered truck or rail cars". No product is now shipped in uncovered containers and never will be. Ore shipments are rare, and if shipped in uncovered containers does not present a problem.

Response: The mitigation measure has been deleted; see Mitigating Measures and Monitoring section of this volume.

Comment No. 9: "No road, pipeline, buried cable, etc., should be allowed on slopes greater than 20%". No one can build a road, pipeline, etc., in this country without encountering many small 20% slopes. Construction generally lessens the slope and results in less erosion than previously occurred.

Response: This mitigation is for slopes greater than 20 percent.

Comment No. 10: "Paleontology" The area is covered with fossil snails, clams, oysters, etc. Any pipeline will encounter them. They have no value and cannnot be separated and recovered from the rocks and there is plenty more a few feet away. Why place this restriction on digging activity?

Response: McGrew and Bown (1976) have recorded significant fossil deposits in the area. Owing to the sensitive nature of these deposits, the Bureau does not describe the exact locations of significant paleontological resources.

Comment No. 11: "No surface disturbing activities should be allowed during periods of high soil moisture". If this means driving down muddy roads it is an unreasonable and unenforceable restriction.

Response: Surface-disturbing activities refer to prospecting and development.

Comment No. 12: "Pipeline trenches should be compacted during backfilling". The northern portion of the sodium lands is covered with pipelines installed up to 50 years ago. There has been no problem of soil erosion from these backfilled trenches, and it is doubtful they were compacted during backfilling.

Response: Soils in the area indicate the need for this mitigation to assure proper backfilling.

Comment No. 13: In one place it says roads, parking lots, etc., should be paved (p. 118) and in

another (p. 120) it says parking areas and storage areas should be covered with gravel.

Response: Mitigating measures have been revised. See Mitigating Measures and Monitoring section of this volulme.

Comment No. 14: "In the event of ground water contamination, the following should be done:
a. ground water sweep
b. chemical treatment
c. reverse osmosis".
Any ground water contamination is dealing with sodium, not heavy metals, and none of the above is practical or even possible.

Response: This mitigating measure has been deleted. See Mitigating Measures and Monitoring section of this volume.

Comment No. 15: In general it can be said that the EA takes an unnecessarily negative attitude toward anything which could be considered bad and therefore needs more regulation, and the positive aspect such as jobs, exports, etc. is almost ignored. The examples of this are: the water usage per ton of soda ash produced is overstated; the energy use per ton of soda ash is overstated; the land use for plants, mines and tailings ponds is probably overstated.

Response: Identification of ways to mitigate adverse impacts is part of the environmental process. Jobs were adequately addressed in the socioeconomic sections of Chapter III, pages 95-96 of Volume 1; as were personal income (pages 100-101) and tax revenues (pages 103-105). Exports are discussed in Appendix 1 of Volume 1. Water use is based on the Wyoming Water Development Commission formula which, according to the Commission (1981) may be high, but adequate for considering impacts. Kostick (1980) reported that 7.2 million BTUs were used to produce a ton of natural soda ash versus 15.8 million BTUs per ton of synthetic soda ash. Land use acreage was determined from a number of sources, including personal communications with the soda ash companies. See also Tenneco (1978), Texasgulf, Inc. (1977), and Wyoming Industrial Siting Administration (1981) references.

Comment No. 16: The value of 15 acres/AUM says that the sodium affected lands of 914,560 acres (p. 18) could support 76,000 antelope or 5,100 cows with calves. This is either ridiculous or the Fish and Game and Private Grazing interests are certainly not utilizing the land like they should.

Response: The livestock grazing section (page 6) noted that 60,970 AUMs are available (914,560 divided by 15) in the trona deposition area. Cattle and sheep graze in the area at different times of the year, and the area's wildlife includes at least 2,750 antelope (page 49), 650 deer (page 51), and 184 wild horses (page 55), as well as some elk and moose. Thus, several animal species do utilize the available forage.

Comment No. 17: To imply (p. 122) that the **visual impact** of future facilities furnishing employment, products, etc. is less important than the effect on a turnout to view wild horses, is an obvious bias against the well being of people and their essential needs.

Response: No such implication is being made. Future facilities could be located elsewhere in the area, and such mitigation as necessary to provide for such development would be site-specific. The wild horse viewing area is intended to provide people with an opportunity to view horses in a natural habitat. The value of such a view is considered by the Bureau a source of well being for horse lovers.

Comment No. 18: About 90% of all the proposed stipulations and mitigating measures fall under the jurisdiction of other regulating agencies. There is no reason to have double or triple regulation of the same items. For each proposed restriction or rule, the BLM should furnish proof that such a regulation is needed to prevent irreparable harm or damage. Nowhere in the EA has this been done....

Response: The proposed stipulations and mitigating measures are designed to keep anticipated impacts at a minimum, thus preventing major impacts from occurring. Such mitigation is in keeping with the intent of NEPA. While many of the proposed mitigation measures are within the purview of other agencies, they are required and need to be followed only once.

Commentator B

Comment No. 1: Although our clients are named as owners of prospecting permit applications in the Draft, we received no notice or copy of the Draft and only inadvertently were made aware of its existence this week. Such lack of notice certainly fails to comply with the spirit and letter of NEPA and regulatory requirements thereunder.

Response: Additional time for comment was granted. All reasonable attempts were made to notify the public of the EA (see Chapter IV of this volume).

Comment No. 2: As a fundamental matter, we believe the EA is attempting to deal with two widely different minerals in a single manner, without recognizing the inherent differences in treatment which

should apply to those minerals. Thus, trona is an easily recoverable mineral, well defined in exploration, geology, extraction and use. Sodium brines, on the contrary, are a puzzling and "unusual" substance about which only limited information is available (p. 37 of EA). It is thus a mistake to attempt to treat development of the two substances in a common manner and each area should be dealt with separately.

Response: The minerals discussed within this document yield sodium carbonate and sodium bicarbonate. Nevertheless, if they were to yield sodium chloride or sodium sulfate, they would still be sodium minerals. The brines of Searles Lake, California, for example, are considered to contain sodium minerals.

Comment No. 3: Since very little is known about the extent, location, use, recovery processing and commerciality of sodium brines, it is entirely appropriate that such minerals be subject to the prospecting permit procedure if this "unique resource" is to be developed in the best interests of the public.

Response: The discovery of "black trona water" has been well documented (pages 37-40), and preference right lease applications still under review (Table AI-3). Until a final decision has been made on those applications, the processing of prospecting permit applications for that area are being delayed.

Comment No. 4: The following comments pertain to the Sodium Carbonate Brine Area (Eden/Farson area) and to the proposed actions and alternatives related thereto which are discussed in the Draft. We find a substantial amount of confusion and ambiguity in the language of the draft report regarding these matters. For example, one of the two "specific elements of the proposed action" in the EA (page 11) states that the BLM will:

'(2) Issue prospecting permits outside the trona deposition area. The trona deposition area as defined in the planning documents is a geological basin (Map I-1) which includes the KSLA. The issuance of prospecting permit may initiate a preference right (noncompetitive) leasing process which could result in a lease and the development of new mine and processing plant. The issuance of a prospecting permit is at the discretion of the BLM with the approval of the Geological Survey.'

Two paragraphs later (also on page 11) the report states:

"There is a further recommendation in the planning system regarding issuance of prospecting permits or competitive leases in the Eden-Farson area. There are two pending preference right lease applications (PRLAs) in the area and 21 prospecting permit applications. According to the MFP recommendations if the preference right leases were issued, BLM would request that the U.S. Geological Survey designate the area as a KSLA for competitive leasing. If the preference right leases were not issued, the area would remain open for prospecting. In terms of the proposed action in this EA, this planning recommendation equates with either item 1 or 2 above since the effects are the same; i.e., leasing and possible development."

These two provisions (the "proposed action" and the "further recommendation") appear to be in direct conflict with each other although the latter provisions are not stated as alternatives or otherwise explained.

Response: Text has been revised. See Revisions section of this volume.

Comment No. 5: The Sodium Brine area should not be designated at present as a KSLA for the following reasons:

- The quantity and areal extent of the sodium brines is largely unknown. Only after further prospecting and definition of the quantity and geographical extent of brines can it be determined whether commercial production is feasible.
- There has been no expression of competitive interest in commercial production of brines to date. The traditional system of using prospectors risk money to develop a data base and information for commercial development should be followed and the risk takers should be entitled to preference rights.
- As a practical matter, only through the active use of the prospecting system will the sodium brines be defined and ultimately developed.
- Pending applications for prospecting permits have been on file for more than a year, fees have been paid, and costs incurred in reliance on the issuance of permits for further exploration. The BLM has had no stated policy against issuance of prospecting permits and in fact acknowledges (page 11) that the lands are currently open for prospecting ("would **remain** open").
- It would be impossible for USGS, consistent with law, regulation and practice, to designate the brine area as a KSLA based on the current level of information.

No determination has been made at present that the sodium brines are extensive enough for commercial production.

Response: As stated on page 11, first paragraph, "The issuance of a prospecting permit is at the discretion of BLM...." This does not ensure that a prospecting permit will be issued; only that the Bureau will consider the application. More information may be necessary on the sodium carbonate brine area; nevertheless, that determination would be made following a decision on preference right lease applications in the area. Rejection of those PRLAs has been appealed (Table A1-3) and a decision is pending.

Comment No. 6: While we believe the sodium brine area should remain open for prospecting permits at present, we think as a minimum matter of fairness and due process, and to meet the legitimate goals of the prospecting system, BLM should issue those permits which are pending and have been pending prior to any notice of change of policy by BLM.

Response: See response to Comment B-5 above.

Commentator C

Comment No. 1: ...recent and proposed new environmental requirements are excessive and also discriminatory as they involve actions, delays and costs which have not and probably would not impact existing producers. The conseqence could be an economic and competitive disadvantage imposed by governmental action. ...existing regulations contribute in large part to the long lead time required to increase Trona and soda ash production and it would be detrimental to all concerned if this process were to become further complicated.

Response: The recent and new environmental requirements are the result of growing public concern over cumulative impacts. The Bureau does not agree that existing producers would be unaffected by the actions involved in this program. Increased trona and soda ash production is, and will remain, subject to demand and the ability of the respective company to market its product.

Commentator D

Comment No. 1: Tables 1-3/4 on page 17 and elsewhere assume Tenneco's 1990 production at 1.0 million tons, **whereas** Tenneco, expects to produce 2.0 million tons per year prior to 1990.

Response: Tenneco could very well produce 2 million tons prior to 1990, or shortly thereafter. The scenarios are only intended as potential development, based on the data available at the time the projections were made, for the purpose of analyzing impacts. The market will determine the actual production in 1990.

Comment No. 2: Table II-4 on page 38 states trona resources in million tons, **whereas** it should be billion tons. Response: Table II-4 has been corrected. See Revisions section of this volume.

Comment No. 3: Page 77, 6th line from left bottom, raises the impression that a typical tailings pond requires 1200 acres, **whereas** this figure is far exaggerating the typical requirements as is evidenced by recent plant developments that have stressed water conservation measures. The typical plant size also appears overstated with 2060 acres. For instance, the Tenneco plant has only slightly more than 200 acres of tailings pond and a total disturbed area, including all right-of-ways, of less than 900 acres.

Response: The tailings pond acreage represents more than one tailings pond. Bureau analysis indicates that several ponds would be necesssary over the life of a plant. The typical plant site averages 420 acres (item 4 of Assumptions, page 77). The 2,060 acres include plant, mine, and all other facilities.

Comment No. 4: Page 80, lower right side, appears to assume that no revegetation is done during the life of a plant, **whereas** large portions of disturbed acreage during a plant's life typically receive immediate restoration and revegetation.

Response: Bureau analysis indicates that some revegetation efforts begin during the life of a plant; however, stable communities would return 20 to 50 years after seeding (page 88 of Volume 1).

Comment No. 5: Page 81, right side, implies that erosion would destroy badland topography, **whereas** most geology books explain badlands as a result of erosion.

Response: Badlands are the result of natural erosion; the badlands are still subject to natural erosion. The accelerated erosion discussed on page 81 would be caused by the activities of man.

Comment No. 6: Page 86, 3rd paragraph on the left side, implies the use and release of cyanide and fluoride in the typical production of soda ash from trona, **whereas** neither one is true.

Response: Cyanide reference has been deleted from text. See Revisions section of this volume. The presence of fluorine in trona has been estab-

lished in discussions with various company representatives and the Minerals Management Service.

Comment No. 7: Page 87, 4th paragraph on the left side, again raises without factual proof, an impression that implies a negative and destructive role of trona mining for "aquifers of good quality" that "may exist", **whereas** in fact the likelihod of such aquifers is unfortunately so low that any reference to good aquifers within the trona deposits is only misleading the uninformed reader.

Response: The paragraph acknowledges that the ground water under most of the area is of poor quality. Reference is made to Chapter II for a detailed discussion of ground water quality and use (pages 42-44). Appendix 5 adds further details for the reader.

Comment No. 8: Page 88, Item d, makes again a negative assertion claiming deteriorating sagebrush communities and relating this to caustic fallout **although**, as was admitted, "little substantiative work has been done."

Response: That assumption (not assertion) has been made on the basis of initial observations indicated in the opening sentence of the paragraph. The Bureau chose to analyze the "worst-case", but also feels more studies are necessary. Toxicity of sodium to vegetation is established on page 88, right column.

Comment No. 9: Page 88, 1st paragraph on the right side, implies that trona mining also mines underlying clay, **whereas** all trona beds have shale as floor rock. The claim that the floor rock contains high level of fluorine is of questionable validity. The immediately following admission that no analyses for fluoride emisssions exist makes one question again what constructive purpose is being served with negative implications void of a factual basis.

Response: The presence of clay taken up with the trona was established by the Minerals Management Service. The toxic nature of fluorine on plant life makes it suspect of impacting vegetation downwind from the plant. The discussion is appropriate to establishing impacts.

Comment No. 10: Page 90, 1st line on the left side, speaks of the adverse impact on potential black-footed ferret habitat, **whereas** numerous studies have failed to prove the existence of black-footed ferrets. By all indications, they are not present in this area.

Response: Black-footed ferret is a species protected by the Endangered Species Act, and studies as indicated are required by law.

Comment No. 11: Page 90, 3rd paragraph from the left bottom, needs to be more specific **because** the danger stated neither exists for all ponds, nor at all times throughout a given year.

Response: Text has been revised; see Revisions section of this volume and response to Comment 1-4.

Comment No. 12: Page 90, 2nd paragraph on the right side, makes an enlightening point that birds die when impacting power lines while in flight, w h e r e a s most people know that birds use such lines for resting.

Response: Birds still fly into powerlines.

Comment No. 13: Page 92, 3rd paragraph on the left side, expresses concern over reduction in the population of wild horses due to the industrial use of grazing range, **whereas** extensive efforts expend taxpayer's money annually to artificially reduce the wild horse population in areas with plenty of grazing range. We heard similar concerns about the winter ranges of antelope **while** thousands of sheep are annually sent to compete with the antelope for food in these same ranges.

Response: Management levels of the horses are discussed on page 55 of Volume 1, as well as the paragraph in question. Little if any impact is noted in fourth paragraph on the basis of management levels. Forage requirements of all grazing animals are met when good range management is applied.

Comment No. 14: Page 92, 3rd paragraph from bottom on the right side, is highly irrelevant to the specific area under discussion.

Response: Conditions that would reduce a cultural site's potential for nomination to the National Register of Historic Places would be a major impact on the resource.

Comment No. 15: Pages 123 and 124 propose under the title "Monitoring" a variety of efforts and specifications that look like the draft for a shopping list prior to scrutinization with respect to realistic options and meaningful tax uses.

Response: The impacts of soda ash fallout could be significant; however, the Bureau believes that further information is necessary before a full assessment can be made. Earlier studies (Lundberg and May 1977, Lundberg 1977, Wyoming Game and Fish Department 1973) indicate that further studies are necessary.

Comment No. 16: Page 126, Item 7, implies a conflict between trona and coal development, **whereas** there are no known mineable coal reserves over or underlying the trona deposits.

Response: Text has been revised. See Revisions section of this volume.

Comment No. 17: Page A-7 incorrectly lists Tenneco Sodium Leases under Producing Sodium Leases. In addition, BLM Lease No. W-095423 to Tenneco has, to our knowledge, an expiration date of 1/31/80 instead of 1/31/81.

Response: Text has been revised. See Table A1-5 in the Revisions section of this volume.

Comment No. 18: Pages A-23/24 deal with prospecting but are largely formulated as if permanent facilities and disturbances are at stake. We feel that many of these stipulations are unnecessarily restrictive. This is particularly true for Items 15, 18, and 24. Typical trona exploration drill sites are small-scale and very short-lived and do not affect grouse habitat beyond, let's say, ¼ to ½ miles away. A 1¾ radius is far excessive. Likewise, not all of the Green River serves as a raptor nesting area and, thus, there is no need for the excessive restriction proposed in Item 24.

Response: The stipulations as listed do not constitute restrictions on permanent facilities as stated. Disturbance would be minor if these stipulations would be followed, and these factors have been considered in analyzing the impacts of prospecting. Item 24 has been amended; see Mitigating Measures and Monitoring Section of this volume.

Comment No. 19: ...the reader might have expected that these scenarios also define the risk of becoming invalid by identifying those parameters that require continuous monitoring and reviews.

Response: Monitoring and mitigation are discussed elsewhere in the document. The parameters (Table III-1, page 78) help establish the potential impacts that would be mitigated and monitored to ensure sound environmental practices in the development of the area's sodium minerals.

Comment 20: There is little reference to the positive benefits that have historically derived from the development of the regional soda ash resources.

Response: The socioeconomic sections of Volume 1 are adequate in addressing the positive benefits of soda ash development: employment, personal income, and tax revenues.

Comment No. 21: Most of these measures do not represent new wisdom to serve the public interest, but are only copied duplicate demands already in effect, either as existing BLM regulations and/or the responsibility of other government agencies.

Response: Although the measures do not present "new wisdom" to serve the public interest, they are in the interest of the public: Protection of the environment is clearly stated in NEPA. Consideration of all applicable mitigation was necessary to do that.

Comment No. 22: (Soils Mitigation) No. 15 — It makes little sense to require a full-blown conservation and reclamation plan (topsoil amounts, soil testing, etc.) for dirt roads.

Response: This mitigating measure has been removed; see Mitigating Measures and Monitoring section of this volume.

Comment No. 23: (Soils Mitigation) No. 16 — Compacting of pipeline trenches is costly and unjustified, and is not in line with established engineering practices which favor mounding.

Response: The soils of the area make compacting of trenches justifiable and in line with good engineering practices.

Comment No. 24: (Water Resources Mitigation) No. 4 — The construction of an emergency containment pond below tailings and containment reservoirs is a contingency requirement for the extremely unlikely event of an impoundment failure. Existing Wyoming regulations require that all proposed tailings reservoirs and dams be constructed in accordance with established engineering principles and be approved by the Wyoming State Engineer, the DEQ/WQD, and the DEQ/LQD. In view of these many design precautions, the catastrophic failure of an approved reservoir or dam is such an improbable event that it certainly cannot justify the additional multi-million dollar expenditure, not to mention the additional surface disturbance, that a secondary impoundment would require.

In addition, a number of conditions may make the construction of a secondary impoundment impossible. One such condition would be the lack of a suitable terrain; another would be the inability to obtain surface rights for the land downstream of an existing reservoir.

Response: This mitigating measure has been deleted. See Mitigating Measures and Monitoring section of this volume.

Comment No. 5: (Water Resources Mitigation) No. 8 — Unclear what is required since reservoir and dam designs already address contingencies.

Response: Reservoir and dam designs do not address a concentrated, highly alkaline solution that could pollute streams and ground water, cause damage to vegetation, etc.

Comment No. 26: (Water Resources Mitigation) No. 9 — The way this is worded would require that **any minor** groundwater would have to be grouted off. This may not be possible and is definitely not practical as only significant groundwater should have to be sealed off.

Response: This mitigation generally follows State law and requirements.

Comment No. 27: (Water Resources Mitigation) No. 20 — This makes no sense in a trona application. The solution is to minimize seepage, not to flush aquifer.

Response: This mitigating measure has been deleted. See Mitigating Measures and Monitoring Section of this volume.

Comment No. 28: (Vegetation Mitigation) No. 1 — This stipulation is based on a great deal of speculation with little supporting facts.

Response: The mitigation is in line with the impact analysis. Little is known of the impacts of soda ash or trona fallout; earlier studies indicate the potential for significant impact. In order to assess the potential impacts, further study is necessary. The Mitigating Measure, however, duplicates the proposed monitoring program ,and thus has been deleted in this volume.

Comment No. 29: (Vegetation Mitigation) No. 8 — This seeding stipulation is very restrictive. Other mulching methods (e.g. straw and hydromulch) have proven to be effective and much more economical. Selection of reclamation methods and mulch types should at least partially be left up to the operator and his experience with local site conditions.

Response: This mitigation takes into consideration local site conditions.

Comment No. 30: (Wildlife Mitigation) No. 2 — Black-footed ferrets have not been sighted in several years, despite continuous efforts on the part of the Federal Government. The trona area is widely covered with prairie dog towns. Limiting their destruction would severely limit the development of the trona resource for no valid reason.

Response: Prairie dog towns are surveyed for black-footed ferrets per the Endangered Species Act. The destruction of these towns should be avoided, but development is not limited by them.

Comment No. 31: (Aquatic Wildlife Mitigation) No. 1 — Implementation of this proposal would increase total water losses. This represents a waste of water resources through evaporation and seepage. The Fontenelle reservoir is a much more effective buffer for regulating seasonal river flows.

Response: This mitigating measure has been removed; see Mitigating Measures and Monitoring section of this volume.

Comment No. 32: (Visual Resources Mitigation) No. 3 — Unclear what is meant by "visual contrast rating."

Response: A definition has been included with the Glossary terms. Comment No. 33: (Land Uses Mitigation) Should be qualified to read: "Ancillary facilities....should follow existing corridors of disturbance **whenever practicable**."

Response: Text has been revised; see Mitigating Measures and Monitoring section of this volume.

Commentator E (1)

Comment No. 1: A major area of concern to the state in recent years has been the increasing multitude of improperly plugged and capped exploratory drill holes. I request the full cooperation and assistance of your agency in this matter. This situation is particularly critical in areas where potential for well interference and intermingling of aquifers or aquifer contamination exists. The limited availability of good quality water in the study area underscores this concern as indicated in the comments provided by our State Engineer's Office. Future sodium leasing or prospecting permits must contain adequate stipulation and monitoring provisions to control and prevent this problem.

Response: The Bureau has provided such stipulation and monitoring provisions.

Comment No. 2: The Wyoming Game and Fish Commission comments indicate major concerns over potential impacts on aquatic wildlife and fisheries. Several of these concerns are predicted on future water resource demands and flow reductions due to increased trona production. Due to the state's controlling role in water allocation decisions, these concerns will be addressed mainly at the state level through site specific analysis of future diversion proposals. This situation will also require planning and cooperation at the state, federal and industry level to develop and implement proper mitigation strategies. Similar efforts will be required to meet the objectives of the Wyoming Department of Agriculture insofar as offsetting or replacing the AUM's lost by sodium mineral development with increased range improvement activities.

Response: The major fisheries impact is low stream flows along the Green River, but also the Bureau must point out that the impact is cumulative. The Bureau has provided the mitigating measure suggested by the Game and Fish Department. The Bureau also has added the mitigation suggested by the Department of Agriculture. The Bureau agrees that planning and cooperation is necessary to assure development under sound environmental practices.

Commentator E (2)

Comment No. 1: Page 44. *Surface Water*, mentions use of surface water in the area for a variety of purposes. The nonconsumptive use of water by a significant fisheries resource was not included. This use should be included since surface water is vital for these fisheries.

Response: Text has been revised. See Revisions section of this volume.

Comment No. 2: Page 53, *Reptiles and Amphibians*, indicates that little information is available for these species other than the species present. This is not true. A Game and Fish Department publication (Baxter and Stone 1980) includes distributional and life history information, and Department field work in 1980 further refined information for some species. Also, we have yet to see documentation of ornate box turtle populations in this area.

Response: Baxter and Stone (1980), Stebbins (1966), and Conant (1975) were referenced in Appendix 4 of Biosystems Analysis, Inc. (1981), the Bureau's contracted wildlife inventory. The ornate box turtle populations have not been substantiated (page 67 of Biosystems Analysis), and the authors suggest additional research.

Comment No. 3: Page 53, *Aquatic Wildlife*, presents an inadequate description of aquatic wildlife in the area. Habitat descriptions are incomplete and relate primarily to streams on BLM land. Some major waters, such as the Green River, (a Class I fishery) and Flaming Gorge Reservoir, received no coverage yet they lie within the known sodium leasing area. We suggest inclusion of information from the Wyoming Game and Fish Department Stream Classification Map and other information.

Response: Aside from identifying the Green River as a Class I fishery, the description is adequate for this environmental assessment.

Comment No. 4: Threatened, endangered or sensitive species were addressed, but other species of great importance locally and regionally were neglected.

Response: See response to Comment No. 3

Comment No. 5: Page 90, *Aquatic Wildlife*, Paragraph 1 indicates that the proposed action would have limited adverse impact on the quality of aquatic habitat under all scenarios. We disagree with this statement; furthermore, the following text in the EA portrays significant aquatic impacts. Flow reduction to about 26 percent of the recommended streamflow on 40 miles of the Green River represents significant aquatic impacts. This flow reduction represents aquatic impacts of a magnitude which would result in an unacceptable fisheries loss. We recommend that a means be devloped to avoid this impact **before** leasing is allowed. Instream flows in the Green River are vital to an important fishery.

Response: The cumulative impact of water withdrawn from the Green River certainly could have substantial impact on the fisheries habitat, but sodium development only contributes to that impact. The statement on flows has been misinterpreted. The Bureau did not intend to indicate that the streamflow had been reduced below the 300 cfs "survival flow" by sodium development-related reductions. Rather, it was intended to indicate the size of the reductions in relationship to the size of the "survival flow". Text has been revised for clarification.

Comment No. 6: Page 122. Measure number two is of value in improving some stream areas where lack of instream cover has been identified as a limiting factor. It is not, however, a substitute for water. Boulders placed in a dry, or nearly dry stream, will not correct the problem of dewatering.

Response: The mitigating measure is intended for low streamflows, not dry to nearly dry streams.

Comment No. 7: Measure number three is neither a mitigating measure nor a prerogative of BLM. Management of this fishery is the responsibility of the Wyoming Game and Fish Department. We do not understand how elimination of a cold-water fishery and a subsequent attempt to manage for warmwater species can be considered mitigation. It is a loss of fisheries resources.

Response: The mitigating measure has been deleted. See the Mitigating Measures and Monitoring section of this volume.

Comment No. 8: Probably the best mitigation measure for aquatic wildlife would be a requirement that all new water intakes associated with the trona industry be located at Flaming Gorge Reservoir. This would prevent dewatering of 40 miles of the Green River, a Class I fishery.

Response: A mitigating measure similar to this has been added. See the Mitigating Measures and Monitoring section of this volume.

Commentator E (3)

Comment No. 1: On page 29, the State Engineer and his authority and resonsibilities are recognized. However, applications to appropriate water must not only be filed with the State Engineer, they must have his approval and a State Engineer permit must be issued prior to the commencement of construction for water developments. This applies to

both surface water and ground water appropriations.

Response: Text has been revised. See Revisions section of this volume.

Comment No. 2: On page 87, concern is expressed over possible inter-aquifer contaminations. We share this concern, particularly in the Big Sandy River area. We urge that special attention be given to proper plugging of all exploratory holes, and to the proper construction and casing of observation and production wells. The Draft EA does address this further in item 13, page A-24, but it is a very important item in view of salt loading to streams and the potential for contamination of the limited aquifers of good quality water in the area.

Response: The Bureau recognizes the importance of proper plugging of exploratory holes and of the proper construction and casing of observation and production wells.

Comment No. 3: Page 120, *Water Resources*, addresses concerns similar to those in Comment 2. It should also be noted that tailings ponds and other water impoundments also require review by the State Engineer prior to the issuance of a State Engineer permit for the impoundment. Again, mines and plant facilities should be designed and consructed to avoid salt loading to the Green River system or aquifer contamination.

Response: Text has been revised; see Revisions section of this volume.

Comment No. 4: Appendix 2, page A-23, item 8 of the proposed prospecting permit conditions. Use of water for drilling purposes from developed stock water sources (or other developed sources) requires a Temporary Use Agreement from the State Engineer. If unappropriated water is to be utilized, a Temporary Use Permit must then be obtained from the State Engineer.

Response: Text has been revised; see Revisions section of this volume.

Comment No. 5: Appendix 2, page A-24, item 17. The State Engineer must also be notified if flowing artesian wells are encountered during exploration, and should also be notified whenever black water is encountered. A State Engineer permit is required for wells drilled to search for water, or for water level or water quality observation wells.

Response: Text has been revised; see Mitigation Measures and Monitoring section of this volume.

Commentator E (4)

Comment No. 1: Mines and processing plants may be located in areas that require new highways to serve them. If mines or plants are located where present highways serve them, the present highway system should provide acceptable transportation service without major modification **provided** it is **not** used to transport raw materials to processing plants or products to market. Highway 530 appears to be the major State highway serving the anticipated new facilities. It cannot withstand sustained heavy truck traffic without major reconstruction.

Response: The vast majority of the current trona/soda ash production is transported by railroad and conveyor system or pipeline (solution), although some products are hauled by truck. Nevertheless, the text has been revised; see Revisions section under Land Uses.

Commentator E (5)

Comment No. 1: Reference Draft EA WY-049-EA81-8, please correct the first listing under State of Wyoming on page 29 to read:

"COMMISSIONER OF PUBLIC LANDS

The Wyoming Commmissioner of Public Lands is responsible for the administration, leasing and management of lands owned by the State of Wyoming. Right-of-way permits must be obtained prior to any access across or before construction begins on State-owned lands."

Response: Text has been revised. See Revisions section of this volume.

Commentator E (6)

Comment No. 1: The Division of Agriculture Planning and Development is very concerned that the BLM has not given adequate consideration to the loss of AUMs by sodium mineral development in Wyoming. Under each scenario the livestock industry stands to lose an average of 1,010 AUMs.

Response: The losses of AUMs are adequately stated for each scenario. In each case, the losses include 540 AUMs removed from production by the existing facilities (page 94, Volume 1). Only site-specific analysis of new development in addition to existing development would adequately address range forage losses.

Comment No. 2: Under the mitigation section of the assessment (p. 123) the BLM avoids the issue of AUM loss by stating the following mitigation alternatives.

1. No utilization of developed stock water sources should be allowed without prior approval of AO.

2. To minimize disruption of lambing operations, no new disturbing activities would be permitted in identified lambing areas from May 1 to June 10.

3. Fencing of all tailing ponds should meet or exceed BLM specifications.

These are not mitigation measures, and should not be listed as such. Mitigation of livestock impacts is the replacement of AUMs by range improvement. . . The Division requests that the livestock mitigation section be rewritten to include exactly that — livestock mitigation. The division further requests that the BLM clearly state the type and location of range improvements to be made in response to each scenario.

Response: The type and location of range improvements by scenario would be pure conjecture. The scenarios are not intended to analyze specific, actual siting of new plants; that would be assessed in a site-specific environmental analysis. The Bureau agrees that replacement of AUMs would mitigate livestock impacts, but authorized use of stock water and protection of lambing operations and range stock are part of livetock management and thus appropriate in this discussion. Mitigation has been provided for range improvements; see Mitigation and Monitoring Section of this volume.

Commentator E (7)

Comment No. 1: Page 23 - Scenario 6 Under variable number 5 - Development is expected to include six new mines? Is there any documentation for this variable? What or which companies are planning development?

Response: The scenario was developed on the basis of existing and potential leasing as one possible way development could occur. Other than that, no documentation is available on this scenario.

Comment No. 2: Page 37 - 5th paragraph under *Sodium Minerals* The five minerals that "may be of commercial interest in the future,, are so finely disseminated and occur in such minor amounts in the trona and oil shale beds that these would essentially have no potential commercial value.

Response: The text has been revised; see Revisions section of this volume.

Comment No. 3: Page 79 - Solution mines and plants Analysis of impacts of trona solution mining should be comparable to that of uranium solution mining with one main exception. Uranium solution mining extracts yellowcake from permeable arkosic sandstones and therefore leaves no void or cavern. With trona solution mining, the ore that is removed is bedded trona; thus, such a mine may have minor subsidence. A major difference between a solution mine and a conventional mine for trona extraction should be the processing plant. If the solution mine will be using an existing trona refinery, the disturbed surface area will be limited in area.

Response: Discussions with potential trona solution mining representatives indicate no appreciable difference in plants. The disturbed surface area would be a series of pipelines to and from pairs of wells, as well as related facilities, which indicate more than limited surface disturbance.

Comment No. 4: Page 36 - Under Geology and mineral resources One possible commodity that is not mentioned, is the 'remote' possibility of diamonds in this region. Both chrome diopside and pyrope garnet have been found in ant hills in the southern part of the trona-bearing region. These indicator minerals suggest the presence of an ultramafic intrusive or intrusives somewhere in the general region (see: Geological Survey of Wyoming, Report of Investigations no. 19, page 4).

Response: This has been added to the text; see Revisions section of this volume.

Commentator F

Comment No. 1: The Draft Environmental Assessment gives the impression that the seven described scenarios are either the only or the most logical scenarios for any future development in the Green River basin. We feel that in no way should these scenarios be interpreted as the only alternatives, and the final Environmental Assessment should either omit them or state that they are not intended to be specific management guidelines.

Response: See page 7 of Volume 1: "The scenarios will be used as the bases for the analysis of the impacts of the proposed action and alternatives." Also see Summary of this volume.

Comment No. 2: Several scenarios in the Draft Environmental Assessment involve expansion of the capacity of existing mines and plants or placement of a limited number of new facilities in areas already under lease. This plan effectively serves to reduce the opportunity for companies without an established property position in the area to become

producers in the district. Such restrictions on capacity and placement are not in keeping with the stated objectives of the plan.

Response: See response to Comment F-1.

Comment No. 3: Qualified applicants should be granted sodium prospecting permits for areas outside of the KSLA but within the trona deposition area where geologic conditions could be favorable for the economic recovery of trona.

Response: By definition, the KSLA contains the only commercially mineable deposits in the area (see Glossary).

Commentator G

Comment No. 1: ...we believe that the proposed action should contain a plan for consolidating federal trona into blocks through exchange with privately (or state) owned trona reserves within the KSLA. For some time, the Forest Service and the U.S. Fish and Wildlife Service have expressed an interest in acquiring trona owned by RME within the Flaming Gorge National Recreational Area (FGNRA) and the Seedskadee National Wildlife Refuge (SNWR), respectively. RME is willing to exchange its trona reserves in these areas for other trona of equal value within the KSLA. As part of the proposed action, we would propose that federal trona located in the KSLA be exchanged for the RME-owned trona located in the FGNRA and the SNWR. This exchange is in the public interest for it allows the federal government to manage trona reserves in these areas.

Response: The Bureau will consider such proposals for exchange on a case-by-case basis. No provision has been made in the sodium planning process for such exchanges, therefore it is not part of the proposed action. Equitable exchanges could be in the public interest.

Comment No. 2: RME encourages the Bureau to assess the characteristics of the trona deposits and consolidate federal sections into logical mining units with private and state-owned resources. This policy is supported for a number of reasons. Of particular importance is that this policy will promote the viability of the trona leasing program and will maximize the recovery of the trona reserves.

Response: This policy is being considered by the Bureau.

Comment No. 3: Applying the Limited Surface Occupancy Criteria (LSOC) to new leases, especially to lease renewals, should be approached cautiously. Several components of the criteria appear to be somewhat inconsistent with surface occupancy restrictions applied in conjunction with other resource management programs (e.g. coal leasing) that are not supported by the current state of knowledge. For example, avoidance of sage grouse nesting and strutting grounds required by the LSOC fails to recognize that impacts to sage grouse habitats can be successfully mitigated.

Application of the criteria also may fragment mining units to the point that the remaining resources could no longer be mined economically. Because the KSLA is located on the checkerboard patern of federal, private, and state ownership, the Bureau's action could effectively condemn private and/or state trona reserves. Application of the criteria on the "checkerboard" is particularly troublesome because state law and local land use plans do not recognize these criteria and would allow the surface to be used for mining activities.

Response: Judicious application of the LSOC is proposed on a site-specific basis (page A-13, Volume 1), and left to the discretion of landowners. The LSOC are mitigating measures that are part of the proposed action.

Comment No. 4: Criterion No. 4 of the LSOC, which addresses protection of visual and recreational values in the Flaming Gorge National Recreation Area, may limit mineral development far greater than was explained. Appendix 1 states that all of the mapable LSOC restricts surface development on approximately 228,640 acres of the trona deposition area. However, the amount of the area with surface occupancy restriction could increase by 40,000 to 50,000 acres if the five-mile (foreground-middleground) buffer zone around the Flaming Gorge reservoir actually became the restriction boundary.

Response: The area surrounding the reservoir that would be affected is included in the 228,640 acres.

Comment No. 5: RME believes that in some cases, surface facilities could be constructed on sections contiguous with the FGNRA without impacting visual values if there was not a direct line of view from the reservoir.

Response: That is within the realm of possibility. The LSOC would be applied on a site-specific basis.

Comment No. 6: Our findings are contrary to the Bureau's statement that "...these measures are supplemental to what is already required by various other agencies..." (page 118). We realize that the Bureau is proposing to select only the measures that are relevant to a particular lease for inclusion as stipulations in the lease renewal. We suggest that the Bureau limit its stipulations only to those

matters not regulated by other state and federal agencies or where the Bureau is mandated by statute or act.

Response: Text has been revised in regard to the statement on page 118. All mitigation possible was considered in the impact analysis. The Bureau is responsible for surface management on public lands, including the protection of the environment.

Comment No. 7: The Bureau's mention of the Energy Research and Development Administration (ERDA) is incorrect. The ERDA is no longer in existence, but has been reorganized into what is now the Department of Energy (DOE). Although the DOE has conducted in situ research near Green River, that research has concluded and the DOE is in a reclamation mode.

Response: Text has been revised; see Revisions section of this volume.

Comment No. 8: Additionaly, we recommend that the Bureau recognize that there are oil shale reserves with shallow overburden in the east edge of the trona deposition area and possibly on the west edge. When evaluating sodium lease applications, consideration should be given to the possible development of oil shale on the same land parcels.

Response: Text has been amended; see Revisions section of this volume. Volume 1 does recognize the potential conflict between trona and oil shale development, as well as noting that trona beds are underlain by shale.

Comment No. 9: The general soils information provided for the regional area is adequate, however, for site specific areas the general soils information would not apply. Hence, we have concerns with information provided in Table II-6 on general soils unit limitations for the KSLA. We assume the soils unit limitations may not have been based on any detailed physical and chemical analysis.

Response: Site-specific ahalysis would be necessary, but not necessarily on the basis of information in Table II-6.

Comment No. 10: The vegetation description of the affected environment appears to be generally adequate for the purpose of a regional environmental description. However, information on dominant plants as well as on commonly occurring plants are lacking and need to be provided for site specific analysis. It would also be helpful to the readers if annual production estimation is included in the vegetation type description.

Response: Annual production estimates per vegetation type serve no useful purpose in this EA. Site-specific analyses would include plants within each type and, if applicable to the affected environment, the annual production estimates.

Comment No. 11: The information provided on threatened and endangered (T/E) plants is incorrect. Of the three species indicated as being present within the KSLA, two of them - *Stanleya pinnata* var. *gibberosa*, and *Astragalus promianthus* are no longer candidates for threatened status (personal communication with R. Dorn -9/14/81) and have already been removed from the threatened status list. The third species - *Physaria condensata* is still on the threatened list. We believe the species does not occur within the KSLA and should therefore be of limited concern.

Response: The plants have not been removed from the proposed threatened status list. The third species does not occur in KSLA, as stated; but could be affected by development outside of that area, as could the other threatened status list candidates.

Comment No. 12: Big Game — It is not clear how the big game crucial winter range designation was ascertained. The pronghorn winter range was said to be dependent on climatic conditions and snow deposition (page 51 Trona EAR). In the winter of 1978-1979, the snow covered their traditional winter range and the pronghorn moved further south. This would indicate that the area designation should not have been a crucial winter range, but rather a traditional wintering area.

Response: Big game crucial winter range is determined by the Wyoming Game and Fish Department. The reference on page 51 has been revised; see Revisions section.

Comment No. 13: Mule deer usage of the area was said to be infrequent. The mule deer winter range is found in the southern portion of the trona deposition area, as indicated on Map II-3. Based on this interpretation, that area is not crucial winter range and should be eliminated from the Limited Surface Occupancy Criterion (LSOC).

Response: Mule deer use as an area resident is infrequent. Crucial winter range does exist in the area for deer.

Comment No. 14: Elk were reported wintering in the southwestern part of the KSLA, but once again no crucial area was mentioned. Based on the above reasons, we feel decisions to limit surface occupancy and/or seasonal use due to big game crucial winter range should be reviewed. If data are inadequate in determining crucial winter range, application of the LSOC should be reserved.

Response: No elk crucial winter range was identified. The LOSC was not applied for elk.

Comment No. 15: Sage Grouse — The general rule that sage grouse nest within two miles of their respective strutting grounds often does not apply.

An ongoing study by RME in the Rawlins BLM District has shown an average distance of 3.84 miles between lek and nest. However, the distances hens moved to the nests ranged from 0.75 to 10.0 miles. Sixty percent of the radioed hens nested more than two miles from their respective strutting grounds. Therefore, the 90 percent figure, cited in the Trona EAR appears misleading. It should be clarified that 90 percent of the birds found within two miles of the lek does not include the entire nesting population, since hens nesting in areas outside of the two-mile radius were apparently unsurveyed. Further, the probability of finding a nest using only ground search methods would decrease dramatically as the distance from the lek increased, making nests located greater than one mile from the lek very difficult to verify. Additionally, one of the strutting grounds shown on Map II-4 appears to be situated in the Flaming Gorge Reservoir. If the lek is near the reservoir, this would only illustrate our reasoning that a two-mile buffer is not uniformly applicable. Grouse are highly selective of nest sites, there is no reason to protect extensive areas that are unsuitable as nesting habitat or brood-rearing habitat regardless of how close they are to a sage grouse lek. Sage grouse strutting grounds and nesting areas should be reviewed on a case-by-case basis.

Response: The majority of the literature on sage grouse reports that 90%, as stated, of nesting is within a two-mile radius of the strutting ground. In addition, the nesting portion of buffer zone is evaluated on a case-by-case basis, with the Authroized Offficer (AO) having the authority to waive restriction in this area (1¾ miles). Map II-4 is not used for management decisions, and the area in question is a limitation of the map scale not an actual case. Exact locations of the leks in the area are available in the Rock Springs District Office.

Comment No. 16: The overall description of socioeconomic conditions in the area of sodium mineral development appears to be appropriate for a regional environmmental assessment. One change the Bureau should consider for the final EAR would be to include data from Lincoln Conty within the description. While most of the socioeconomic impacts have been and will be located in Sweetwater and Uinta counties, sodium development has caused a small amount of growth in the city of Kemmerer and Lincoln County.

Response: Lincoln Conty data was assessed during the preparation of the draft EA. Virtually no growth could be atributed to sodium development.

Comment No. 17: Housing — The rate of housing vacancies in Rock Springs is given as 3 percent. Our best estimate places the vacancy rate slightly lower at 1.5 to 2.0 percent. Besides the general rate of vacancies, it is more useful if housing availability is evaluated on the basis of type i.e., mobile homes, apartments and single family dwellings. Currrently, the main housing shortages in Green River and Rock Springs are in the categories of mobile homes and apartments.

Response: Estimates by the Rock Springs city planner are adequate for this assessment.

Comment No. 18: Mention is made of the use of cyanide in processing trona in Scenario 1. We have not identified any trona mining or processing operation in the Green River Basin that uses cyanide.

Response: Text has been revised. See Revisions section of this volume.

Comment No. 19: Andesitic tuffs and fluorapatites are discussed as being sources of fluorine. Although the text says "(see glossary)," these terms are not identified.

Response: Definitions of these terms appear in the Glossary of this volume.

Comment No. 20: Our principal concern, with respect to the impacts analyzed for each scenario, is the 20 to 50 year time frame required for restoration of stable plant communities on disturbed lands. We believe that adequate reclamation could be accomplished within 5 years of topsoil replacement for grassland areas, and within 15 years for shrublands. Stable plant communities could therefore be established within a 10 to 20 year time frame for most disturbed lands.

Response: The Bureau does not agree.

Comment No. 21: The assumption that sodium compounds and hydrofluorides were the causal agents involved in the deterioration of plant communities is not substantiated by adequate data. Due to the lack of knowledge on the amount of sodium present in the native soils, we question the degree of impact which introduced sodium compounds might have on the plant communities. Soil tests that have been taken on undisturbed playa soils do not substantiate the assumption that hydrofluorides were the cause of degradation to plant communities because of the presence of unusually high levels of fluorides in the native soils.

Response: Please reread the analysis on page 88. No assumption has been made that hydrofluorides are causal agents. Both fluorine and sodium compounds were indicated by the companies as plant emissions-the toxicity of both compounds to plants requires an analysis as presented. Studies indicate sodium compounds could affect vegetation in the area (Lundberg and May 1977; Lundberg 1977); thus, the Bureau proposes further study of this question.

Comment No. 22: We feel further research is needed to adequately assess the impact of trona fallout on the plant communities and the number of acreages involved.

Response: The Bureau agrees. See Monitoring section.

Comment No. 23: It is true that no matter which alternative is chosen for the leasing decision process, there will be some loss of vegetation. However, vegetation loss due to mining is only temporary. The overall vegetation disturbance will be insignificant because only 1 to 2 percent of the KSLA area will be affected.

Response: Cumulative impact analysis indicates that this is only a portion of the potential losses in the area. Oil shale development, new roads, etc., could be added to trona development to make losses far greater than indicated in this document. Nevertheless, vegetation losses to development would cover only a small portion of the KSLA as stated.

Comment No. 24: Mammals — We feel further study and documentation is required to adequately assess the big game habitat issue. Impacts to big game winter ranges of the magnitude indicated in Chapter II, which would calculate to 64.12 acres/antelope and 150.0 acres/deer, could be mitigated with off-site range improvement project.

Response: Mitigation has been provided for habitat loss (see page 121, Volume 1). Further mitigation is provided through the application of the LSOC. Big game crucial winter range is established by the Wyoming Game and Fish Department, which has expressed deep concern over its loss and potential loss in this area (pers. comm., 1980).

Comment No. 5: It is unclear how the number of impacted antelope cited in each scenario was calculated if the areas are not at carrying capacity. The "estimated 86 wintering antelope" displaced in scenario one would not be adversely affected if the surrounding area is at carrying capacity. Habitat improvement projects would only be needed if alternative wintering areas are indeed at carrying capacity.

Response: See response to Comment No. 24 above.

Comment No. 26: Birds — The loss of migratory waterfowl as a result of their use of the tailings ponds requires further research. An effective mitigation technique may be found to prevent these losses as an alternative to bird halfway houses.

Response: The Bureau would welcome an opportunity to review any research projects proposed by the trona companies.

Comment No. 27: In reference to the concerns presented in the scenarios on impacts to raptors, we have the following recommendations. Slow speed limits could be enforced on the roads to reduce the number of road kills. Removal of large road kills could aid in reducing the concentrations of raptors along the roads. Artificial nest structures could be constructed to attract raptors, providing alternative sites away from disturbance during the nesting period. Call (1979) and Olendorff, et. al. (1980) have reported successful nesting on artificial structures for 11 of the 18 species listed in Chapter II. Properly designed powerlines would offset the electrocution problems (personal communication M. Nelson).

Response: Speed limits as recommended would be difficult to enforce. Removal of debris is part of the Bureau's mitigating measures. Successful nesting on artificial structures is recognized, but whether it would be applied in the sodium development area would be determined after application of the LSOC. The Bureau encourages the use of properly designed powerlines.

Comment No. 28: A number of concerns were mentioned in the scenario one analysis. Included in the following are a few mitigation considerations. To protect minimum flows, during drought years or in late summer or fall, water storage could be considered during the periods of high flow. This could be regulated to minimize eutrophication and reduction of habitat quality. Special design features could also be investigated to prevent the impact on post larvae and young fish from water intake structures used to supply refineries or other structures requiring a cooling process.

In light of these and other potential mitigation strategies, the Bureau should recognize that management of stream flows is dictated by other state and federal agencies, primarily through control of the Fontenelle Reservoir. Mitigation measures should be evaluated with the cooperation of the appropriate agencies and only be applied where necessary and reasonable. The Fontenelle Reservoir was created as a multiple use project, not only to increase fisheries, but to provide a water supply system. Management situations must strike a balance between water uses in keeping with a multiple use approach. The Bureau must consider the economic realization that controlled use of water and mitigation stipulations could place an undue financial burden on industry.

Response: The Bureau has considered these factors, and has recognized within this document the authority of other agencies. Consideration has been given to the various uses of the water, including the sizeable water rights of the trona companies, and no "undue financial burden" has been es-

tablished as being placed on this industry. The concern for fisheries is below Fontenelle Reservoir.

Comment No. 29: We believe that mining under all alternatives would not have any significant impact on livestock and rangelands because of the insignificant amount of forage that will be removed. A total of 60,970 AUM's has been assessed as the AUM amount available in the trona deposition area. Mining under the different scenarios is expected to remove approximately 380 to 727 AUM's.

Some of these AUM's that will be removed could be replaced in a short time through mitigation measures such as range improvement through fertilization, which would increase forage production and palatability of certain grasses and forbs.

Response: Cumulative impact analysis indicates that this is only a portion of the potential loss. Mitigation as suggested has been added to the Mitigating Measures and Monitoring section.

Comment No. 30: In reference to adverse impact on lambing operations in the spring, we would like to point out that the only significant lambing area identified for the KSLA area is in the extreme southern edge of the KSLA boundary (Map A1-1). The southern edge of the KSLA is not likely to have significant mining operations, hence lambing operations should not be affected. This is corroborated by the discussion presented in Chapter II, pg. 61 under Livestock Grazing.

We would also like to point out that when lease applications are submitted, a working relationship could be developed between the applicant, the BLM official, and the livestock permitee. Lambing areas or livestock grazing could be relocated to satisfy both the livestock owner and lease applicant.

Response: The discussion on page 61 does not corroborate the statement that the lambing operations would not be affected. The KSLA has commercially mineable deposits of trona, and hence this area could be leased and developed. The discussion in the second paragraph indicates the commentator also is thinking in that direction. Site-specific analysis could result in such a working relationship.

Comment No. 31: We recognize that in the absence of scientific and technical information, it is difficult to accurately quantify potential impacts to water resources. However, we would encourage the Bureau to continue to substantiate water resource impact projections through consultation with appropriate state and federal agencies.

Response: The water resource projections were based on a formula provided by the Wyoming Water Development Commission (1981). The formula is recognized to yield higher water use than perhaps is actually used, but it is adequate for this analysis. The proper consultation has taken place.

Comment No. 32: ...the Bureau has projected that degradation to groundwater would occur during all phases of trona development. However, given the proper controls during prospecting, exploration, and development of trona, there is little opportunity for groundwater contamination to a resource that is of poor quality in its natural state. Furthermore, the lack of knowledge regarding solution mining techniques makes impact projections highly speculative at this date.

Response: The Bureau feels that, given the proper controls, potential impacts to groundwater would be averted. Some projections are possible on the basis of discussions with those companies considering solution mining. The limitations of those projections are stated in Volume 1.

Comment No. 33: One correction should be made in the description of the Rock Springs sewage treatment capacity. Although the recently constructed sewage treatment facility is operating at capacity, funds have been budgeted for expansion of the facility to accommodate another 3,000 residential hook-ups. A temporary treatment facility is being operated to provide additional capacity for current demand.

Response: Text has been revised; see Revisions section of this volume.

Comment No. 34: ...the Bureau chose to include only those items which it proposes to enforce as mineral lease stipulations. We suggest that BLM list all major mitigation measures (including socioeconomic) whether the Bureau administers them or not. Based on our regulatory comparison, the Bureau should implement only those few mitigation measures which are not under the jurisdiction of other state and federal agencies.

Response: The Bureau has listed mitigating measures and stipulations for impacts that could occur as a result of developments on public lands, the management of which is the Bureau's responsibility. Implementation of any mitigation that overlaps with other agencies is in the spirit of cooperation with those agencies, and within the realm of managing the public lands. Socioeconomic impact generally does not require Bureau mitigating measures, unless public lands are involved. The Bureau encourages companies to work with State and local agencies to alleviate any such impacts.

Comment No. 35: Only a few socioeconomic mitigation measures were mentioned in this section. Recently constructed trona facilities have been required to give assistance to impacted commmunities by the Wyoming Industrial Siting Council. We

believe that the Council and not the Bureau is the appropriate authority to require and enforce a socioeconomic mitigation plan for new trona developments. The Bureau briefly stated in Chapter I that Sweetwater and Uinta County Commissioners have jurisdiction over land use zoning in the trona deposition area. In addition to zoning responsibilities, county and city government agencies provide a major means of planning and providing community infrastructure. Coordination between the BLM, county, and local governments as well as other regulatory agencies can be a significant means of implementing socioeconomic mitigating measures.

Response: See response to Comment No. 34 above.

Comment No. 36: The environmental monitoring program proposed in Chapter III assumes that there are major environmental impacts caused by trona development that require long-term monitoring. We believe that a more systematic approach be taken to determine the need for long-term monitoring.

Response: The purpose of the monitoring, as stated on page 123, is to gather information needed to assess the impacts. Earlier studies as cited in the EA suggest potentially significant impacts, and the Bureau feels that such potential sufficiently establishes the need for further study.

Comment No. 37: Since baseline soils and vegetation data are not available from the early days of trona mining the premining conditions have to be approximated. The rate of trona fallout is decreasing over time due to retrofitting of air pollution controls on the older plants as required by the State Implementation Plan for the Trona Nonattainment area. These factors and many others have to be considered when designing an appropriate monitoring plan.

Response: The measurements required within the monitoring study would reflect the rate of trona fallout, as well as indicate changes in water quality, air quality, soils, etc. A decrease in the rate of trona fallout does not decrease the need to monitor the potential impacts as proposed by the Bureau. The establishment of how trona fallout affects plants would be of general scientific interest as well as aid in practical application of mitigation measures to reduce the impact. Air pollution controls may very well reduce the impact in an insignificant level.

Note: Table 1, found in Appendix 9, contains a listing of the mitigating measures. Generally speaking, most of the concerns listed in this table are addressed elsewhere in the Bureau's responses to public comment or in revisions to mitigation. The Bureau found the table interesting and recommends the reader review it. It is noted, however, that BLM is responsible for management of the public lands and therefore responsible for what occurs on those lands. Clear statements of how the lands could be affected and how those effects could be mitigated is in the interest of the general public as well as the specific publics affected by these actions. Comments on Appendix 1, found in Apendix 9, also have been addresed elsewhere in the Bureau's responses.

Commentator H

Comment No. 1: Pg 46, P4 Reference is made to Appendix #4 for water quality. It should be Appendix #5.

Response: Text has been revised. See Revisions section of this volume.

Comment No. 2: Pg 86, P6 Reference is made to the glossary for terms "andesitic tuffs and fluorapatites". They are not there.

Response: The terms have been added to the Glossary of this volume.

Comment No. 3: Pg 90, P1 Mammals. Reference is made to the glossary for "human harrassment". Term is not there. This term is refered to again on Pg 92, P2 under WILD HORSES.

Response: The term has been added to the glossary of this volume.

Comment No. 4: Pg 121, P4 Wildlife. The term 'guzzlers' is not universal and should, we feel, be in the glossary.

Response: The term has been added to the glossary of this volume.

Comment No. 5: Pg 106 Scenario Three, Air Quality. This section refers twice to increasing concentrations of PSD. We believe it's meant to be TSP.

Response:

Text has been revised. See Revisions section of this volume.

Comment No. 6: Pg 78 Table III-1 gives the maximum/minimum year 2000 soda ash production water use requirement as being 52,743 acre-feet/year and 45,894 acre-feet/year respectively. On Pg 90, where the impacts of soda ash industry expansion are being discussed, "Sodium related flow reductions..." which is taken to mean the soda ash industry, as it's been connotated to mean throughout the report, "...would amount to 70-80 CFS..." From Table III-1 pg 78 they are 63.4 - 72.9 CFS not 70-80.

Response: Table III-1 is correct. Text on page 90 has been revised. See Revisions section ofthis volume.

Comment No. 7: Pg 44 Surface Water The draft connotes that the Upper Colorado River Compact and the Bureau of Reclamation list Wyoming's Green River water allotment as 805,000 ac-ft/yr. It also lists the average annual flow for the Green River as 369,600 ac-ft/yr at Daniel, Wyoming. This makes the allotment figure 435,000 ac-ft/yr more than what is available.

This apparent discrepancy also comes under our third category critique, data biases, and we repeat our concern that worse case conditions should depict probable, real life situations. In this case the average river flow is given as 369,600 ac-ft/yr. This is the correct figure for flows at Warren Bridge near Daniel which is near the head water of the Green River. When the year 2000 expanded soda ash industrial water requirements (45,894 - 52,743 ac-ft/yr) are compared to this figure they appear significant. The draft indicates that these withdrawals will be so severely impact the river that the trout habitat will be destroyed.

In looking at the U.S.G.S. report *Water Resources Data for Wyoming* 1979, WY-79-2, Vol. -2, page 114, the figure of 369,600 ac-ft/yr at Daniel is correct. However, the average flow near Green River, which is much closer to the actual water withdrawl points associated with the KSLA is, for a period of record of 29 years, 1,234,000 ac-ft/yr. When compared to this figure the future 51,000-58,000 ac-ft/yr usage is insignificant (< 5%) and more accurately depicts actual conditions.

Response: The impact of water withdrawals is cumulative; uses of Green River water as listed on page 44 each reduce the streamflow and there are periods of low flow. Apparently not considered in this comment is the amount of water necessary to support the trout habitat. Note on page 90 that sodium development-related reductions would be of greatest concern during periods of low streamflow.

Comment No. 8: Pg 55 Cultural, Archeology. In this section it is reported that 13,745 acres have been surveyed for archeological sites in the KSLA and that 350 sites have been located giving an average site density of 21.5 sites/square mile for this area. If the data is correct 350 sites/13,745 acres = 350 sites/21.5 square miles = 16.3 sites/square mile not 21.5.

Response: Text has been revised. See Revisions section of the volume.

Comment No. 9: Pg 90 Birds P6 mentions that electrical power lines can electrocute large birds. There have been reports made in various newspapers that economical control devices to prevent this have been developed and are being used throughout the state.

Response: Large birds are still being electrocuted and therefore, it is an impact and it is described in the impact section. The fact that devices do exist in the State does not lessen the fact that the devices are not in universal use throughout the state. It also establishes a need for mitigation, which the Bureau does provide.

Comment No. 10: Pg 44 P2 The statement is made that trona processing represents a tap on ground water resources. To our knowledge none of the trona processing plants use groundwater for their process water or any other purpose.

Response: Use of ground water by trona processing plants is indicated by the Wyoming Industrial Siting Administration in its staff report on the Texasgulf expansion.

Comment No. 11: Pg 88 P (d) Indicates that 85% of the TSP emissions found down wind from the existing soda ash companies contains sodium compounds (Na_2CO_3, $NaHCO_3$, raw trona) and that the other 15% was insoluble matter such as clays or other impurities. It is claimed that this information resulted from conversations with Mr. Dee Peverley of FMC as well as other industry personnel. We cannot comment on the other industry persons, but Mr. Peverley recalls talking with BLM personnel, but not about chemical constituents of the TSP emissions. We believe that your reference relates to the fact that the mined ore consists of about 85% sodium compounds and 15% insolubles, but not TSP fugitive emissions.

Response: Bureau records of the conversation indicate otherwise.

Comment No. 12: Pg 92 Impacts to Aquatic Wildlife. In this section the impact of increased stream sedimentation levels and dissolved solids concentrations are projected to occur from new plant site runoff. This impact should not be listed. The Wyoming DEQ and Federal EPA require that all plant area runoff be contained on site and used or placed in evaporation/tailings impoundments in order to achieve compliance with the "zero" discharge NPDES permit.

Response: The impact could occur if not mitigated as suggested. Mitigation has been provided.

Comment No. 13: Pg 92 Impacts to Aquatic Wildlife The statement that increased industrial water usage induced 'low flows' would increase sediment, therefore increasing aquatic plant growth, thus increasing BOD levels and reducing the DO is highly speculative and an unnecessary attempt to intensify the negative impact of industrial expansion.

Response: Please reread the impact analysis. The Bureau makes no such statements related to industrial expansion or water use.

Comment No. 14: This section also implies that a very serious threat to the Green River fish populations will result through the construction of new plant water intake structures. If necessary these structures can be designed to minimize any threat to fish. However, even without such precautions the impact of theses structures is so insignificant that to include it as such, again represents an unsubstantiated negative bias.

Response: The concern was expressed by the Wyoming Game and Fish Department, and can easily be mitigated. This impact can be substantiated by the Game and Fish Department.

Comment No. 15: It states that these are supplemental to what is already required by other agencies. Unfortunately they are also repetitive. Examples include: Seeding and revegetation requirements, topsoil stockpiling, air quality control measures; nearly all the measures listed are addressed by other agency regulations.

Response: Text has been revised. See Revisions section of this volume.

Comment No. 16: Many of those which are not, have been judged either as economically unfeasible or as not having been proven to be effective. For example:

1. Water Resources #4 Pg 120 calls for emergency containment ponds. Recently the Wyoming DEQ proposed such a regulation and in a hearing before the Wyoming Environmental Quality Council it was rejected on the basis of its extreme cost for a low risk condition.
2. Under this same heading proposal #20 requires the rectification of a contaminated aquifer by flushing the aquifer with fresh water, chemically treating the system or using reverse osmosis and reinjection. No mention is made as to whether or not the aquifer needs to be qualified as good or bad. Also, none of these methods have proven to be very effective at restoring a good "fresh water" aquifer and all are costly corrective measures.

Response: These mitigation measures have been removed. See Mitigating Measures and Monitoring section of this volume.

Commentator I

Comment No. 1: In regard to assumptions, we think it might have been appropriate to include a scenario which presumes that all of the growth in the soda ash industry after 1990 would be via solution mining and the new technology now being developed. If our own estimates are correct and some of the public pronouncements by FMC are borne out by a later experience, it could well be presumed that the new technology offers sufficient economic inducement to gradually phase out the older plants over a period of years.

Response: The Bureau agrees that solution mining could be the future technology in the soda ash industry. Nevertheless, no projections of an all-solution mining scenario can be made at this time because it is felt that current investments for existing mine equipment would prohibit such a scenario. Projections beyond the year 2000, when such a scenario may be feasible, were not made in this assessment.

Commentator J

Comment No. 1: So far, acreage of severe impacts or destruction of vegetation is small compared with the whole. However, year-by-year accumulation of soda-ash over wide areas will continue, even increase substantially with new development. If plant communities are impacted, as it appears they will be, not only will habitat for wildlife and livestock be diminished, but erosion resulting from loss of ground cover could literally silt-in the Green River and hasten eutrophication of the Flaming Gorge.

We agree that X number of acres utilized for plant sites and utility corridors translates to less forage for wildlife. However, cumulative effects that stem from many roads, much disturbance, many people, and unknown impacts from stack-emmision fall-out will undoubtedly be of greater significance than mere number of acres occupied by trona development.

Response: Future plant/mine development will be considered in site-specific analysis. Monitoring as proposed should help establish the impact of stack emissions, or so-called "soda ash fallout".

Comment No. 2: We concur with the EA monitoring plan as outlined on pages 123-24. In addition, we believe a fluorine monitor should be installed in the Green River, above the city water supply intake. Installation of this device would only seem logical since there are concerns regarding amounts of fluorine in the river.

Response: The Bureau does not believe at this time that its analysis would support a fluorine monitor in the Green River.

Comment No. 3: We believe that surge-ponds should be a required item for any plant drawing water from the Green or Blacks Fork rivers. During periods of lowflow, use of surge-pond water rather than further drawing down the rivers would greatly benefit fisheries, aquatics, and even Flaming Gorge.

Response: After reconsideration of the mitigation for low streamflows, the Bureau determined that taking water at the Flaming Gorge Reservoir would better protect the fisheries habitat.

Comment No. 4: The EA's forecast that only a few antelope, deer, etc. will be lost to increased production of trona is rather unrealistic. The numbers will prove to be much higher.

To offset some of these impacts we believe cost/benefit derived from improving existing habitat, improving and restoring riparian areas, developing water sources and fencing these areas to create mini-riparian zones, would be a wise investment in the future of Green River Basin wildlife.

Response: Mitigation provided by the limited surface occupancy criteria was taken into account prior to impact analysis, as were the prospecting lease stipulations, since they are part of the proposed action. Application of the criteria and stipulations would reduce potential losses. Mitigation as indicated would be considered in mitigating wildlife habitat impacts.

Commentator K

Comment No. 1: On page 44, Surface water, no information is provided on the presence or absence of surface springs or seeps. If springs or seeps are present within and/or adjacent to the area covered by the draft assessment, this information should be included in this section of the report.

Response: Text has been revised; see Revisions section.

APPENDIX 9

COMMENT LETTERS

A

RECEIVED
BLM ROCK SPRINGS
DISTRICT
SEP 17 '81

AM	OPER
ADM	SP
D	SO
DM	RS
SE	SW
ES	PINE
ALL PERS	MP

September 15, 1981

Mrs. Renee Dana
Sodium EA Team Leader
Bureau of Land Management
Rock Springs District Office
P.O. Box 1869
Rock Springs, Wy. 82901

Dear Mrs. Dana:

In going through the Sodium Mineral Development Environmental Assessment Draft, I find that there are several technical errors concerning the chemistry dealing with trona and as a result some of the conclusions and recommended mitigating measures are off-base.

On page 86 mention is made of the "caustic" nature of trona tailings. Trona and related compounds are alkaline in nature ($CO_3^=$ ph 10.5) not caustic (OH^- ph 14). There is no "cyanide" used in the processing of trona and there is no "fluoride" released which would harm anything. The fluoride present in the final product from both the sesquicarbonate and monohydrate processes is less than 10 ppm ard is in the form of sodium fluoride. There is no hydrofluoride formed and any emissions from the plant would result in less fluorine in the soil than occurs naturally as is stated on p. 86 "554 ppm fluorine is twice the average for many soils." There are also no "long-chain hydroxides" used in any processing, including solution mining solvent.

On p. 90 it implies that any waterfowl spending one hour on the tailings pond is rendered incapable of flying. This is not true. Throughout most of the year birds can be on the tailings ponds for long periods (at least 24 hours) without harm. Only for a few days in the fall when the temperature is dropping rapidly will any crystallization occur in the ponds. It is therefore a rare and infrequent occasion when one hour on a tailings pond will render a bird incapable of flying.

On p. 94 it states that "Livestock losses could also result from leaving tailings ponds, mud pits, or brine pits unfenced". I have observed unfenced trona tailing ponds and mud pits for over 25 years and have never observed livestock losses from such activities. Animals do not drink the solution nor do they get stuck in the mud and drown.

The mitigating measures under wildlife, wildhorses and livestock recommends fencing of tailings ponds and pit. This is completely unnecessary. As pointed out above, there is no dangerous cyanide, fluoride or long chain hyroxides which would poison an animal. Tasting of the water is not fatal and would convince anything not to drink of it. Animals are too smart to wade in it. I can catagorically state from being around such ponds for over 25 years, that there are more antelope, cows, sheep, coyotes and rabbits killed every week by automobiles on the roads within the sodium lands than have been killed by all the tailing ponds and mud pits since the trona deposits were discovered 43 years ago. This is also true of I-80, which is fenced but which still results in animal kills. There is absolutely no justification for fencing of ponds to reduce animal losses.

Other comments concerning "Mitigating Measures".

1 - "No surface disturbance would be allowed within one-fourth mile of well preserved wagon ruts". This would be fine if the BLM would identify and fence off such locations. I was involved with a gas pipe line construction a decade ago and we were to tunnel under and lay down plywood over such a "two trail historic road". This we did, but shortly thereafter the correct trail was identified by better experts as a "two trail road" several hundred yards away which had already been dug up in crossing it. If the experts cannot adequately determine "well preserved wagon trails" why should they be preserved? Any wagon trail is today a jeep road and keeping recreational vehicles off of them is more important than preventing damage by sodium leasors or prospectors.

2 - "All ore or product shipment should be done in covered truck or rail cars". No product is now shipped in uncovered containers and never will be. Ore shipments are rare, and if shipped in uncovered containers does not present a problem.

3 - "No road, pipeline, buried cable, etc., should be allowed on slopes greater than 20%". No one can build a road, pipeline, etc., in this country without encountering many small 20% slopes. Construction generally lessens the slope and results in less erosion than previously occurred.

4 - "Paleontology" - The area is covered with fossil snails, clams, oysters, etc. Any pipeline will encounter them. They have no value and cannot be separated and recovered from the rocks and there is plenty more a few feet away. Why place this restriction on digging activity?

5 - "No surface disturbing activities should be allowed during periods of high soil moisture". If this means driving down muddy roads it is an unreasonable and unenforceable restriction. No one, including BLM personnel is going to walk home when they get caught out in a prolonged rain storm or spring thaw. When the public at large stays off the wet roads, then restrictions might be applicable

to sodium leasors who are minor users of the unimproved roads.

6 - "Pipeline trenches should be compacted during backfilling". The northern portion of the sodium lands is covered with pipelines installed up to 50 years ago. There has been no problem of soil erosion from these backfilled trenches, and it is doubtful they were compacted during backfilling.

7 - In one place it says roads, parking lots, etc., should be paved (p. 118) and in another (p. 120) it says parking areas and storage areas should be covered with gravel.

8 - "In the event of ground water contamination, the following should be done:

a. ground water sweep
b. chemical treatment
c. reverse osmosis".

Any ground water contamination is dealing with sodium, not heavy metals, and none of the above is practical or even possible.

To fully discuss all of the aspects of the errors, misconceptions, etc. in the EA draft would require effort beyond that permitted by the time limitations specified for comments. In general it can be said that the EA takes an unneccessarily negative attitude toward anything which could be considered bad and therefore needs more regulation, and the positive aspect such as jobs, exports, etc. is almost ignored. The examples of this are: the water usage per ton of soda ash produced is overstated; the energy use per ton of soda ash is overstated; the land use for plants, mines and tailings ponds is probably overstated. The value of 15 acres/AUM says that the sodium affected lands of 914,560 acres (p. 18) could support 76,000 antelope or 5,100 cows with calves. This is either ridiculous or the Fish and Game and Private Grazing interests are certainly not utilizing the land like they should.

To imply (p. 122) that the visual impact of future facilities furnishing employment, products, etc. is less important than the effect on a turnout to view wild horses, is an obvious bias against the well being of people and their essential needs.

About 90% of all the proposed stipulations and mitigating measures fall under the jurisdiction of other regulating agencies. There is no reason to have double or triple regulation of the same items. For each proposed restriction or rule, the BLM should furnish proof that such a regulation is needed to prevent irreparable harm or damage. Nowhere in the EA has this been done, the only justification given seems to be that BLM has the authority and therefore they should regulate so that the AO can have a job.

The BLM should reconsider the entire EA. BLM should first show

that the procedure and regulations used in the past for issuing sodium leases and prospecting permits has been unsatisfactory and that changes can be justified, particularly the added costs to BLM and industry of enforcing new regulations.

Sincerely yours,

W.R. Frint

W.R. Frint
1295 Indian Hills
Green River, Wy. 82935

B

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(303) 861-8120

September 18, 1981

Sodium EA Team Leader
Bureau of Land Management
Rock Springs District Office
P. O. Box 1869
Rock Springs, Wyoming 82901

RE: Sodium Mineral Development
Environmental Assessment (Draft)
Dated August, 1981

Dear Sir:

This letter is written in response to the subject Draft Environmental Assessment on behalf of the following applicants for sodium prospecting permits in the Sodium Brine area: John N. Tippit, Olaf N. Nielsen, Philip E. Johnson, Bradford Wells, H. Michael Spence and James Mosley. We request that the comments and suggestions contained herein be made part of the official record. Our comments are as follows:

1. Although our clients are named as owners of prospecting permit applications in the Draft, we received no notice or copy of the Draft and only inadvertently were made aware of its existence this week. Such lack of notice certainly fails to comply with the spirit and letter of NEPA and regulatory requirements thereunder. The Draft states that 500 persons "thought to have an interest in the area" were sent letters in 1980. We find it hard to explain why we were not included in such mailing. As a result of lack of notice the following comments are being made without time for full development, and we request an additional 30 days in which to supplement these comments. We request your written acknowledgement and acquiescence in our request for extension.

2. As a fundamental matter, we believe the EA is attempting to deal with two widely different minerals in a single manner, without recognizing the inherent differences in treatment which should apply to those minerals. Thus, trona is an easily recoverable mineral, well defined in exploration, geology, extraction and use. Sodium brines, on the contrary, are a puzzling and "unusual" substance about which only limited information is available (p. 37 of EA). It is thus a mistake to attempt to treat development of the two substances in a common manner and each area should be dealt with separately. Since very little is known about the extent, location, use, recovery processing and commerciality of sodium brines, it is entirely appropriate that such minerals be subject to the prospecting permit procedure if this "unique resource" is to be developed in the best interests of the public.

3. The following comments pertain to the Sodium Carbonate Brine Area (Eden/Farson area) and to the proposed actions and alternatives related thereto which are discussed in the Draft. We find a substantial amount of confusion and ambiguity in the language of the draft report regarding these matters. For example, one of the two "specific elements of the proposed action" in the EA (page 11) states that the BLM will:

> "(2) Issue prospecting permits outside the trona deposition area. The trona deposition area as defined in the planning documents is a geological basin (Map I-1) which includes the KSLA. The issuance of prospecting permit may initiate a preference right (noncompetitive) leasing

> process which could result in a lease and the development of new mine and processing plant. The issuance of a prospecting permit is at the discretion of BLM with the approval of the Geological Survey."

Two paragraphs later (also on page 11) the report states:

> "There is a further recommendation in the planning system regarding issuance of prospecting permits or competitive leases in the Eden-Farson area. There are two pending preference right lease applications (PRLAs) in the area and 21 prospecting permit applications. According to the MFP recommendations if the preference right leases were issued, BLM would request that the U.S. Geological Survey designate this area as a KSLA for competitive leasing. If the preference right leases were not issued, the area would remain open for prospecting. In terms of the proposed action in this EA, this planning recommendation equates with either item 1 or 2 above since the effects are the same; i.e., leasing and possible development."

These two provisions (the "proposed action" and the "further recommendation") appear to be in direct conflict with each other although the latter provisions are not stated as alternatives or otherwise explained. In any event, since leases

were not issued at the time prospecting permit applications were filed, and are not issued today, pending applications should be processed and permits issued.

4. We support the issuance of pending prospecting permits in the Sodium Brine area in keeping with the objectives of (1) promoting discovery of new sodium mineral deposits through prospecting, (2) promoting competition by industry and (3) fair return to the U.S. The Sodium Brine area should not be designated at present as a KSLA for the following reasons:

> -- The quantity and areal extent of the sodium brines is largely unknown. Only after further prospecting and definition of the quantity and geographical extent of brines can it be determined whether commercial production is feasible.
>
> -- There has been no expression of competitive interest in commercial production of brines to date. The traditional system of using prospectors risk money to develop a data base and information for commercial development should be followed and the risk takers should be entitled to preference rights.
>
> -- As a practical matter, only through the active use of the prospecting system will the sodium brines be defined and ultimately developed.
>
> -- Pending applications for prospecting permits have been on file for more than a year,

B

fees have been paid, and costs incurred in reliance on the issuance of permits for further exploration. The BLM has had no stated policy against issuance of prospecting permits and in fact acknowledges (page 11) that the lands are currently open for prospecting ("would remain open").

-- It would be impossible for USGS, consistent with law, regulation and practice, to designate the brine area as a KSLA based on the current level of information. No determination has been made at present that the sodium brines are extensive enough for commercial production.

5. We believe BLM should have a policy at all times of either accepting and issuing prospecting permits or rejecting such applications. By acceptance of the application and filing fee, the BLM implys that they intend to iasue permits. Our clients filed a number of applications in June,1980, and earlier with BLM and fees were accepted. They nave expended a considerable amount of time and effort in preparing an exploratory drilling program on the proposed permit lands and arranging financing for tnat program, in reliance on issuance of the permits by BLM. While we believe the sodium brine area should remain open for prospecting permits at present, we think as a minimum matter of fairness and due process, and to meet the legitimate goals of the prospecting system, BLM should issue those permita which are pending and have been pending prior to any notice of cnange of policy by BLM.

In conclusion, we request that the BLM clearly state its decision to issue pending prospecting permits in the aodium brine area and that until such time as data and information are adequate to develop competitive leasing interest a policy of further prospecting be maintained. We urge the BLM to act promptly on all existing applications for prospecting permits and to isaue permits as permitted by law.

Very truly youra,

H. Michael Spence

HMS:pg

C

Tenneco Oil Processing & Marketing

September 23, 1981

Sodium EA Team Leader
Bureau of Land Management
Rock Springs District Office
P.O. Box 1869
Rock Springs, WY 82901

Presented below please find Tenneco's comments on the Auguat, 1981 Draft Environmental Aasessment of Sodium Mineral Development in Rock Springs District, Wyoming (Document WY-049-EA81-8). These comments address:

(1) Specific Reservations and Apparent Errors, and
(2) Overall Impressions and Recommendations

Specific Reservations and Apparent Errora

The eighteen items below do not include reservationa and apparent errora identified for the chapter "Mitigating Measures" on pages 118-125 of the BLM draft document. This chapter is dealt with separately later on under the heading "Overall Impressions and Recommendations."

1. Tables 1-3/4 on page 17 and elsewhere assume Tenneco's 1990 production at 1.0 million tons, whereaa Tenneco expects to produce 2.0 million tons per year prior to 1990.

2. Table II-4 on page 38 states trona resources in million tons, whereaa it should be billion tons.

3. Page 77, 6th line from left bottom, raises the impression that a typical tailings pond requires 1200 acres, whereas this figure is far exaggerating the typical requirements as is evidenced by recent plant developments that have stressed water conservation measures. The typical plant size alao appears overstated with 2060 atres. For instance, the Tenneco plant has only slightly more than 200 acres of tailings pond and a total disturbed area, including all right-of-ways, of less than 900 acres.

4. Page 80, lower right side, appears to assume that no revegetation ia done during the life of a plant, whereas large portions of disturbed acreage during a plant's life typically receive immediate restoration and revegetation.

5. Page 81, right side, implies that eroaion would destroy badland topography, whereas most geology books explain badlands as a result of erosion.

Tenneco Oil

6. Page 86, 3rd paragraph on the left side, implies the use and release of cyanide and fluoride in the typical production of soda ash from trona, whereas neither one is true.

7. Page 87, 4th paragraph on the left side, again raises without factual proof, an impression that implies a negative and destructive role of trona mining for "aquifers of good quality" that "may exist", whereas in fact the likelihood of such aquifers is unfortunately so low that any reference to good aquifers within the trona deposits is only misleading the uninformed reader.

8. Page 88, Item d, makea again a negative assertion claiming deteriorating sagebrush communities and relating this to caustic fallout although, as was admitted, "little substantiative work has been done."

9. Page 88, 1st paragraph on the right side, implies that trona mining also mines underlying clay, whereas all trona beds have shale as floor rock. The claim that the floor rock contains high level of fluorine is of questionable validity. The immediately following admission that no analyses for fluoride emissions exist makes one question again what constructive purpose is being served with negative implications void of a factual basis.

10. Page 90, 1st line on the left side, speaks of the adverse impact on potential blackfooted ferret habitat, whereas numerous studies have failed to prove the existence of blackfooted ferrets. By all indications, they are not present in this area.

11. Page 90, 3rd paragraph from the left bottom, needs to be more specific because the danger stated neither exists for all ponds, nor at all times throughout a given year. Thia ia a physico-chemical fact that needs to be clearly understood.

12. Page 90, 2nd paragraph on the right side, makes an enlightening point that birda die when impacting power lines while in flight, whereas most people know that birds use such lines for resting. The fact that birds fly occasionally into an obstacle is true, but they also fly into cliffs and trees and manmade facilities such as cars.

13. Page 92, 3rd paragraph on the left aide, expresses concern over reduction in the population of wild horses due to the industrial use of grazing range, whereas extensive efforts expend taxpayer's money annually to artificially reduce the wild horse population in areas with plenty of grazing range. We heard similar concerna about the winter ranges of antelope while thousands of sheep are annually sent to compete with the antelope for food in these same ranges.

C

14. Page 92, 3rd paragraph from bottom on the right side, is highly irrelevant to the specific area under discussion.

15. Pages 123 and 124 propose under the title "Monitoring" a variety of efforts and specifications that look like the draft for a shopping list prior to scrutinization with respect to realistic options and meaningful tax uses. Restrain needs to be exercised in defining required procedures so that all interests are brought into balance and realistic options are recommended rather than wishful one-sided thinking.

16. Page 126, Item 7, implies a conflict between trona and coal development, whereas there are no known mineable coal reserves over or underlying the trona deposits.

17. Page A-7 incorrectly lists Tenneco Sodium Leases under Producing Sodium Leases. In addition, BLM Lease No. W-095423 to Tenneco has, to our knowledge, an expiration date of 1/31/80 instead of 1/31/81.

18. Pages A-23/24 deal with prospecting but are largely formulated as if permanent facilities and disturbances are at stake. We feel that many of these stipulations are unnecessarily restrictive. This is particularly true for Items 15, 18, and 24. Typical trona exploration drill sites are small-scale and very short-lived and do not affect grouse habitat beyond, let's say, 1/4 to 1/2 miles away. A 1-3/4 radius is far excessive. Likewise, not all of the Green River serves as a raptor nesting area and, thus, there is no need for the excessive restriction proposed in Item 24.

Overall Impressions and Recommendations

The draft document WY-049-EAB1-8 is aimed at making an environmental assessment of the development of the regional sodium mineral resources. In the limelight is, of course, the Known Sodium Lease Area (KSLA) that covers the trona deposits to the west and the northwest of Green River, Wyoming. In the introduction to the draft document, these deposits are properly labeled "a resource that is of international as well as national importance." The approach taken, i.e., to identify and compare alternate development scenarios and their consequences is sound and deserves applause. Naturally, one must always bear in mind that a scenario is only a projection, an assumption, not a reality. Consequently, the reader might have expected that these scenarios also define the risk of becoming invalid by identifying those parameters that require continuous monitoring and reviews.

In contrast to the sound scenario approach taken to preparing this document, stands the unfortunate overall message that radiates to the reader a predominance of negatives and hazards linked to the development of these magnificent sodium resources. There is little reference to the positive

benefits that have historically derived from the development of the regional soda ash resources. It makes the reader wonder how the document can serve a positive purpose if so much emphasis is placed on limelighting "potential" dangers of such development and so little credit is given to the proven socioeconomic health and other positive results of which this area prides itself. In fact, our review has shown that many environmental impacts are stated in exaggerated form and/or in the context of unproven assumptions. Again, how can this approach reconcile with the official mission of this draft document, which is to serve the healthful development of these mineral resources in the best interest of the public, that means all public.

One of Tenneco's primary concerns deals with the extensive mitigating measures proposed in the document on pages 118 through 125. Our concerns fall into two categories as follows:

1. Most of these measures do not represent new wisdom to serve the public interest, but are only copied duplicate demands already in effect, either as existing BLM regulations and/or the responsibility of other government agencies. Let us look at some examples in support of this statement:

   - All the proposed mitigating measures for air quality are duplicative of the existing DEQ/AQD Rules and Regulations.
   - The paleontology stipulation is a standard condition of all BLM right-of-ways.
   - Soil stipulations are duplicates as shown on the attached Exhibit 1 (copy of page 119 of the BLM draft document).
   - Water Resources - Stipulations 3, 6, 7, 17, and 19 are already addressed by the DEQ/LQD, the DEQ/WQD, and the State Engineer.
   - Vegetation stipulations 2, 3, 6, and 7 are addressed by the DEQ/LQD. No. 4 is addressed in standard BLM stipulations for right-of-ways.
   - Wildlife stipulations 6 and 7 are taken care of by the U.S. Fish & Wildlife Service (migratory bird protection act).
   - Aquatic wildlife stipulations 1, 2, and 3 are best left the responsibility of the Wyoming Game & Fish Department.
   - Cultural resources stipulations 1 and 3 already exist as BLM requirements.

To sum up, our comment here is that mitigating measures need to be defined with mature delineation of their complimentary scope and needs so as to avoid unproductive redundance.

2. Many of the mitigating measures are also infeasible or unreasonable and thus likely counterproductive rather than supportive for the healthful development of this important mineral resource. The following stipulations are particularly objectionable and/or of questionable value:

Soil Stipulations

No. 15 - It makes little sense to require a full-blown conservation and reclamation plan (topsoil amounts, soil testing, etc.) for dirt roads. This is overkill.

No. 16 - Compacting of pipeline trenches is costly and unjustified, and is not in line with established engineering practices which favor mounding.

Water Resources Stipulations

No. 4 - The construction of an emergency containment pond below tailings and containment reservoirs is a contingency requirement for the extremely unlikely event of an impoundment failure. Existing Wyomong regulations require that all proposed tailings reservoirs and dams be constructed in accordance with established engineering principles and be approved by the Wyoming State Engineer, the DEQ/WQD, and the DEQ/LQD. In view of these many design precautions, the catastrophic failure of an approved reservoir or dam is such an improbable event that it certainly cannot justify the additional multi-million dollar expenditure, not to mention the additional surface disturbance, that a secondary impoundment would require.

In addition, a number of conditions may make the construction of a secondary impoundment impossible. One such condition would be the lack of a suitable terrain; another would be the inability to obtain surface rights for the land downstream of an existing reservoir.

No. 8 - Unclear what is required since reservoir and dam designs already address contingencies.

No. 9 - The way this is worded would require that any minor groundwater would have to be grouted off. This may not be possible and is definitely not practical as only significant groundwater should have to be sealed off.

No. 20 - This makes no sense in a trona application. The solution is to minimize seepage, not to flush aquifers.

Vegetation Stipulations

No. 1 - This stipulation is based on a great deal of speculation with little supporting facts.

No. 8 - This seeding stipulation is very restrictive. Other mulching methods (e.g. straw and hydromulch) have proven to be effective and much more economical. Selection of reclamation methods and mulch types should at least partially be left up to the operator and his experience with local site conditions.

Wildlife Stipulations

No. 2 - Black footed ferrets have not been sighted in several years, despite continuous efforts on the part of the Federal Government. The trona area is widely covered with prairie dog towns. Limiting their destruction would severely limit the development of the trona resource - for no valid reason.

Aquatic Wildlife Stipulations

No. 1 - Implementation of this proposal would increase total water losses. This represents a waste of water resources through evaporation and seepage. The Fontenelle reservoir is a much more effective buffer for regulating seasonal river flows.

Visual Resources Stipulations

No. 3 - Unclear what is meant by "visual contrast rating."

Land Uses Stipulations

Should be qualified to read: "Ancillary facilities.....should follow existing corridors of disturbance whenever practicable."

To sum up, our recommendation is that mitigating measures be defined on the basis of objectively established needs and proven implementation methods rather than on the basis of speculated eventualities and lacking implementation technology.

* * * * *

C

Tenneco Oil

Sodium EA Team Leader
Bureau of Land Management
September 23, 1981
Page 7

As a final comment, Tenneco strongly recommends that the BLM commits to a high priority effort of leasing to encourage rather than discourage effective development of the Green River, Wyoming sodium resources. This includes a specific recommendation that the highest priority of leasing be given federal sections bordered by two or more active lease blocks, under preference-right or competitive procedures. Such leases would greatly improve the mine planning and, thus, resource utilization and recovery efforts of given lease holders. In addition, such leases would foster the expansion of existing operations (as considered in Scenario #2) rather than the grassroot development of new operations with their considerably larger impact on the area's socioeconomic fabric. Tenneco's intent to expand by 100% its plant now under construction needs to be viewed in this light.

It is hoped that the efforts invested into our review of the BLM draft document and our comments relative to apparent deficiencies will be a contribution to improving the document so that it will truly serve all public interest. If there are questions that Tenneco might help to resolve, we welcome your call.

Sincerely,

L. H. E. Weyher
Technical Superintendent

LHEW/rnmm

Attachment

cc: D. R. Delling, General Manager
M. S. Litus, Environmental Engineer

EXHIBIT I

SOILS

1. All disturbed areas should be recontoured, topsoiled, and seeded as soon as possible after construction. (See Vegetation for seeding procedures.)

2. Upon abandonment of plant and mine sites, reclamation as listed in No. 1 above should be commenced immediately.

3. Site grading should be carried out only where absolutely required, as determined by the AO. Topsoil stockpiling should be done for all suitable soils as determined by the authorized officer.

4. No surface disturbing activities should be allowed during periods of high soil moisture content which would cause excessive rutting of existing roads and/or trails.

5. Construction of roads with frozen earth material mixed with snow and ice should not be allowed, unless permitted by the AO, because it would result in unstable roads causing movement of the roads during thaws. The resulting sediment of such movement would impact adjacent watersheds, riparian areas, and streams.

6. Loading facilities and associated transportation routes should be periodically cleaned through the use of vacuum or other forms of pickup.

7. All stockpiles (coal, soda ash, trona, etc.) should be covered or housed to prevent wind- or water-caused contamination of soils.

8. Soil characteristics should be one of the considerations for possible plant and tailings ponds locations. Trona fallout would have less impact on coarse-textured soils; however, vegetation is apt to be more severely affected by trona on coarse-textured soils.

9. All solid waste (trash and garbage) material generated during construction and operation should be collected and disposed of in an authorized sanitary landfill.

10. All embankment fill material for reservoir dams should come from within the reservoir areas and no borrow pits should be required unless special materials are called for, such as clay for filling a core trench. If a separate fill area is utilized, after the fill is removed the area should be stabilized.

11. A soil conservation plan tailored to each mine site should be developed and approved by the BLM AO prior to construction. The soil conservation plan will include:

a. Identify on map of area
- Surface disturbance during construction
- Location of topsoil and amount
- Sources and amount of fill material
- Soil test sites for monitoring
- Potential soil erosion areas

b. Soil erosion control methods with potential site locations as identified on map of area

c. Revegetation of disturbed areas
- Methods
- Materials
- Time frames

d. Soil fertility program to meet revegetation needs of disturbed areas.

12. Waterbars should be installed on disturbed and rehabilitated areas to prevent erosion. General guidelines for installation of waterbreaks are: less than 2% grade, 200-foot interval; 2-4% grade, 100-foot interval; 4-5% grade, 75-foot interval; greater than 5% grade, 50-foot interval. A certain degree of latitude is allowed in the waterbreak interval spacing. Unstable soils may require a closer interval spacing, whereas the interval spacing may be greater on very stable soils or rock outcroppings. A conservative (close) interval spacing is the general recommendation. Waterbreaks are generally constructed on the contour and empty on the downhill side of the cleared area. They are to be constructed to begin in vegetation on the uphill side and feather out into vegetation on the downhill side.

13. There should be no blocking of drainages with vegetation or soil that has been removed.

14. Prior to road construction, centerline survey and construction designs, requested by the AO, should then be approved by the BLM AO.

15. Non-paved roads should meet the above criteria (No. 4 air quality, No.5, and No. 11 soils) and/or reviewal of the route would be required.

16. Pipeline trenches should be maintained in order to correct settlement and erosion. Pipeline trenches should be compacted during backfilling. All pipelines should be buried where they cross existing roads.

17. Topsoil or soil material should be stripped from permanent access roads and railroad routes, and should be distributed along the cuts and fills and backslopes and should be seeded.

18. Runoff should be diverted from exposed areas to stabilized channels.

119

D

CHURCH & DWIGHT CO., INC.

20 KINGSBRIDGE ROAD · PISCATAWAY, N.J. 08854

DWIGHT C. MINTON
CHAIRMAN

RECEIVED
BLM ROCK SPRINGS
DISTRICT

SEP 28 '81

September 25, 1981

DMF ... OPER
ADM ... SP
PO ... SO
ADMIN ... RS
P & E ... SW
RES ... PPNE
ALL PERS ... RPM

Mr. Donald H. Sweep
United States Dept. of the Interior
Bureau of Land Management
District Office
P. O. Box 1869
Rock Springs, Wyoming 82901

Dear Mr. Sweep:

Our company is appreciative of the opportunity to express its views on your draft "Sodium Mineral Development - Environmental Assessment."

Church & Dwight made its original commitment to Wyoming and Trona as a raw material source in 1968. This venture was a small manufacturing facility which, nevertheless represented a major investment for us at the time. Since then we have expanded our production capability by more than tenfold. Today our investment at this location is approximately half of our total assets and 70% of our production capability for Refined Bicarbonate of Soda. Our Green River facility also represents about 40% of the country's total productive capacity for this important and versatile product. Today Church & Dwight's annual sales approximate $100,000,000, our assets are in the order of $75,000,000 and sodium based products are virtually our entire business. In relation to size, we believe that Church & Dwight has made by far the largest commitment to Sweetwater County and a reliance on the sustained and competitive availability of Trona and/or Trona based raw materials.

We also believe that during the 1980's, the demand for sodium products based on Wyoming Trona could increase substantially as a result of the possible termination of operations at Syracuse, closure of certain soda ash plants in Europe, increasing exports, and new applications not specifically identified in the report. For a new Wyoming soda ash producer, the lead time is six to eight years as compared with three to four years for expansion by existing producers. The new producer also faces a considerably larger investment per unit of capacity.

CONSUMER PRODUCTS AND SPECIALTY CHEMICALS

CHURCH & DWIGHT CO., INC.

Mr. Donald H. Sweep
Bureau of Land Management

September 25, 1981
Page 2

Accordingly, we believe that a continuation of the NO ACTION leasing policy would favor the existing producers and discriminate against those companies who desire to contribute to the development of this national resource. The country's free enterprise system with associated competitive and economic forces will provide for an orderly growth without government intervention. We think this will also benefit the consumer, companies needing sodium products and people buying glass or bakery products.

Further, we believe that selective action on lease applications would almost certainly entail discrimination. This is because prospective bidders will have varying current positions and requirements for viable Trona extracting operations.

From the above comments, you can perceive that Church & Dwight favors an UNLIMITED LEASING alternative while maintaining the existing acreage limitations. We think that this approach is the only equitable one and would further ensure maximum future exports with associated royalty and balance of payment benefits.

With regard to environmental considerations, Church & Dwight has two basic concerns. First, let me say that we believe our company has an excellent record of environmental responsibility and we intend to maintain that posture. However we believe that recent and proposed new environmental requirements are excessive and also discriminatory as they involve actions, delays and costs which have not and probably would not impact existing producers. The consequence could be an economic and competitive disadvantage imposed by governmental action. Secondly, Wyoming is already considered to have one of the best environmental programs in the country and we believe that existing agencies should continue to practice an undivided responsibility for maintaining appropriate standards. We endorse responsible preservation of the environment. However, existing regulations contribute in large part to the long lead time required to increase Trona and soda ash production and it would be detrimental to all concerned if this process were to become further complicated. In summary, we believe that the entire section on MITIGATING MEASURES should be made available for at least 90 days for detailed examination and comment by everyone who could be affected.

Your comprehensive and detailed report did not reach our New Jersey office until September 9th, so we have not yet been able to complete our review of all of its content. For example, we have a need to better understand the potential implications of "protection of visual values" as discussed on page 60.

D

CHURCH & DWIGHT CO., INC.

Mr. Donald H. Sweep
Bureau of Land Management

September 25, 1981
Page 3

We consider the above principles to be important and trust that we will have the opportunity to discuss them with you before the report is finalized.

Respectfully yours,

Dwight C. Minton

DCM:tpw

Dwight C. Minton
Chairman

E1

WYOMING
EXECUTIVE DEPARTMENT
CHEYENNE

ED HERSCHLER
GOVERNOR

RECEIVED
SEP 30 1981
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ROCK SPRINGS, WYOMING

September 28, 1981

Mr. Ron Herdt
Sodium EA Team Leader
Bureau of Land Management
Rock Springs District Office
P.O. Box 1869
Rock Springs, WY 82901

Dear Mr. Herdt:

The environmental assessment regarding sodium mineral development in the Rock Springs District has been circulated for review by various state agencies. Copies of their comments are enclosed for your consideration and use. The proposed action of issuing new competitive leases within the Known Sodium Leasing Area and issuing prospecting permits outside the trona deposition area appears to be a reasonable course of action to meet the resource development, industry competition and fair return to the public objectives. Further, the required site specific environmental analysis for development proposals and resultant mitigation measures, stipulations and monitoring requirements should insure that future development is conducted in an environmentally acceptable manner.

A major area of concern to the state in recent years has been the increasing multitude of improperly plugged and capped exploratory drill holes. I request the full cooperation and assistance of your agency in this matter. This situation is particularly critical in areas where potential for well interference and intermingling of aquifers or aquifer contamination exists. The limited availability of good quality water in the study area underscores this concern as indicated in the comments provided by our State Engineer's Office. Future sodium leasing or prospecting permits must contain adequate stipulation and monitoring provisions to control and prevent this problem.

Mr. Ron Herdt
Page 2
September 28, 1981

Our Water Development Commission is currently identifying the water resource availability and demand in the Green River Basin. Their preliminary draft projections of current and potential water needs in the Basin are now being reviewed at the state level. When the data and projections are finalized, they will be submitted to you for consideration in future leasing and development decisions.

The Wyoming Game and Fish Commission comments indicate major concerns over potential impacts on aquatic wildlife and fisheries. Several of these concerns are predicated on future water resource demands and flow reductions due to increased trona production. Due to the state's controlling role in water allocation decisions, these concerns will be addressed mainly at the state level through site specific analysis of future diversion proposals. This situation will also require planning and cooperation at the state, federal and industry level to develop and implement proper mitigation strategies. Similar efforts will be required to meet the objectives of the Wyoming Department of Agriculture insofar as offsetting or replacing the AUM's lost by sodium mineral development with increased range improvement activities.

Thank you for the opportunity to review this assessment. Please keep me informed of future progress in this effort.

Yours sincerely,

Ed Herschler

EH:pcd
enclosures
cc: U.S. Geological Survey
Conservation Division

E2

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Game and Fish Department

CHEYENNE, WYOMING 82002

EARL M. THOMAS
DIRECTOR

September 21, 1981

EIS 639/L1 BLM Rock Springs Dist.
Sodium Mineral Development EA
Sweetwater, Uinta, Lincoln and
Sublette Counties.
(WY-049-EA81-8).

Mr. Donald H. Sweep, District Manager
Rock Springs District
Bureau of Land Management
P.O. Box 1869
Rock Springs, Wyoming 82901

Dear Mr. Sweep:

The following comments are submitted for your consideration in finalizing this Environmental Assessment.

The seven scenarios for development of trona resources present unacceptable impacts to the fisheries resource. Development of the subject lease under conditions described in this EA would result in the loss of 40 miles of Class I stream on the Green River. Inadequate protection and mitigation were given for fisheries resources. Adequate fisheries protection measures must be included before the proposal would be acceptable from a fisheries standpoint.

Page 44. Surface Water, mentions use of surface water in the area for a variety of purposes. The nonconsumptive use of water by a significant fisheries resource was not included. This use should be included since surface water is vital for these fisheries.

Page 53, Reptiles and Amphibians, indicates that little information is available for these species other than the species present. This is not true. A Game and Fish Department publication (Baxter and Stone 1980) includes distributional and life history information, and Department field work in 1980 further refined information for some species. Also, we have yet to see documentation of ornate box turtle populations in this area.

E2

Page 53, Aquatic Wildlife, presents an inadequate description of aquatic wildlife in the area. Habitat descriptions are incomplete and relate primarily to streams on BLM land. Some major waters, such as the Green River, (a Class I fishery) and Flaming Gorge Reservoir, received no coverage yet they lie within the known sodium leasing area. We suggest inclusion of information from the Wyoming Game and Fish Department Stream Classification Map and other information.

Threatened, endangered or sensitive species were addressed, but other species of great importance locally and regionally were neglected.

Page 90, Aquatic Wildlife, Paragraph 1 indicates that the proposed action would have limited adverse impact on the quality of aquatic habitat under all scenarios. We disagree with this statement; furthermore, the following text in the EA portrays significant aquatic impacts. Flow reduction to about 26 percent of the recommended streamflow on 40 miles of the Green River represents significant aquatic impacts. This flow reduction represents aquatic impacts of a magnitude which would result in an unacceptable fisheries loss. We recommend that a means be developed to avoid this impact before leasing is allowed. Instream flows in the Green River are vital to an important fishery.

Page 122. Of the three mitigating measures presented, only measure number one is acceptable. Measure number two is of value in improving some stream areas where lack of instream cover has been identified as a limiting factor. It is not, however, a substitute for water. Boulders placed in a dry, or nearly dry stream, will not correct the problem of dewatering.

Measure number three is neither a mitigating measure nor a prerogative of BLM. Management of this fishery is the responsibility of the Wyoming Game and Fish Department. We do not understand how elimination of a cold-water fishery and a subsequent attempt to manage for warm-water species can be considered mitigation. It is a loss of fisheries resources.

Probably the best mitigation measure for aquatic wildlife would be a requirement that all new water intakes associated with the trona industry be located at Flaming Gorge Reservoir. This would prevent dewatering of 40 miles of the Green River, a Class I fishery.

Overall, aquatic wildlife were inadequately considered. We recommend that this be corrected in the Final Environmental Statement.

Comments on terrestrial wildlife aspects of this EA will be forwarded upon receipt from our field personnel. Please contact us if we may be of further help.

Sincerely,

Bruce Marker

H. BRUCE MARKER,
ENVIRONMENTAL SPECIALIST,
WYOMING GAME AND FISH DEPARTMENT.

HBM/mlr
cc: Assistant Director, Operations
Game Division
Fish Division
State Planning Coordinator

E3

SEP 18 '81

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

State Engineer's Office

BARRETT BUILDING CHEYENNE, WYOMING 82002

September 16, 1981

MEMORANDUM

TO: Dick Hartman, State Planning Coordinator

FROM: Louis E. Allen, Water Resources Engineer

SUBJECT: State Identifier Number 81-131, Sodium Mineral Development, Rock Springs BLM District, Draft Environmental Assessment.

I have reviewed the subject Draft Environmental Assessment with interest. It seems to be one of the better prepared documents I have examined. The water resources coverage is generally satisfactory, except for the following specific comments which extend the author's statements in most cases.

1. On page 29, the State Engineer and his authority and responsibilities are recognized. However, applications to appropriate water must not only be filed with the State Engineer, they must have his approval and a State Engineer permit must be issued prior to the commencement of construction for water developments. This applies to both surface water and ground water appropriations.

2. On page 87, concern is expressed over possible inter-aquifer contaminations. We share this concern, particularly in the Big Sandy River area. We urge that special attention be given to proper plugging of all exploratory holes, and to the proper construction and casing of observation and production wells. The Draft EA does address this further in item 43, page A-24, but it is a very important item in view of salt loading to streams and the potential for contamination of the limited aquifers of good quality water in the area.

3. Page 120, Water Resources, addresses concerns similar to those in Comment 2. It should also be noted that tailings ponds and other water impoundments also require review by the State Engineer prior to the issuance of a State Engineer permit for the impoundment. Again, mines and plant facilities should be designed and constructed to avoid salt loading to the Green River system or aquifer contamination.

4. Appendix 2, page A-23, item 8 of the proposed prospecting permit conditions. Use of water for drilling purposes from developed stock water sources (or other developed sources) requires a Temporary Use Agreement from the State Engineer. If unappropriated water is to be utilized, a Temporary Use Permit must then be obtained from the State Engineer.

5. Appendix 2, page A-24, item 17. The State Engineer must also be notified if flowing artesian wells are encountered during exploration, and should also be notified whenever black water is encountered. A State Engineer permit is required for wells drilled to search for water, or for water level or water quality observation wells.

Thank you for the opportunity to review this material. The referral memorandum is being returned as requested.

LEA/ht

cc: George L. Christopulos
State Engineer

Richard Stockdale
Ground Water Geologist

E4

THE STATE OF WYOMING

Ed Herschler, Governor
Lero Monghini, Superintendent and Chief Engineer

Wyoming State Highway Department

P. O. BOX 1708 CHEYENNE, WYOMING 82001

September 10, 1981

Environmental General
BLM EA on Sodium Mineral Development
Rock Springs District
State ID 81-131

Mr. Dick Hartman
State Planning Coordinator
2320 Capitol Avenue
Cheyenne, WY 82002

Dear Mr. Hartman:

We have reviewed the Environmental Assessmeot on sodium mineral development in the Green River basin and offer the following comments:

1. Mines and processing plants may be located in areas that require new highways to serve them.

2. If mines or plants are located where present highways serve them, the present highway system should provide acceptable transportation service without major modification provided it is not used to transport raw materials to processing plants or products to market.

3. Highway 530 appears to be the major State highway serving the anticipated new facilities. It cannot withstand sustained heavy truck traffic without major reconstruction.

Very truly yours,

William P. King

William P. King, P. E.
Environmental Services Engineer

WPK/mg

E5

THE STATE OF WYOMING

Commissioner of Public Lands and Farm Loans

2424 PIONEER AVENUE
PIONEER BUILDING

CHEYENNE, WYOMING 82002

September 15, 1981

PLEASE ADDRESS REPLY TO THE COMMISSIONER

Sodium EA Team Leader
Bureau of Land Management
Rock Springs District Office
P.O. Box 1869
Rock Springs, WY 82901

Dear Sir:

Reference Draft EA WY-049-EA81-8, please correct the first listing under State of Wyoming on page 29 to read;

"COMMISSIONER OF PUBLIC LANDS

The Wyoming Commissionar of Public Lands is responsible for the administration, leasing and management of lands owned by the State of Wyoming. Right-of-way permits must be obtained prior to any access across or before construction begins on State-owned lands."

Thank you for the opportunity to comment.

Very truly yours,

Carl E. Lundell

FOR Carl E. Johnson
State Forester

BEL:eb

E6

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Wyoming Department of Agriculture

TELEPHONE: (307) 777-7321 CHEYENNE, WYOMING 82002

JOHN CARON, COMMISSIONER

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COLLEGE OF AGRICULTURE
UNIVERSITY OF WYOMING, LARAMIE

DATE: September 25, 1981

TO: Don Daiss,
Assistant Commissioner

FROM: Collin Fallat, Director CF
Division of Agriculture Planning & Development

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT
SODIUM MINERAL DEVELOPMENT

The purpose of this memorandum is to respond to BLM's Environmental Assessment of Sodium Mineral Development in the Rock Springs District, Wyoming.

The Division of Agriculture Planning and Development is very concerned that the BLM has not given adequate consideration to the loss of AUMs by sodium mineral development in Wyoming. Under each scenario the livestock industry stands to loose an average of 1,010 AUMs.

Under the mitigation section of the assessment (p. 123) the BLM avoids the issue of AUM loss by stating the following mitigation alternatives.

1. No utilization of developed stock water sources should be allowed without prior approval of AO.

2. To minimize disruption of lambing operations, no new disturbing activities would be permitted in identified lambing areas from May 1 to June 10.

3. Fencing of all tailing ponds should meet or exceed BLM specifications.

These are not mitigation measures, and should not be listed as such. Mitigation of livestock impacts is the replacement of AUMs by range improvement, not stopping the development of stock watering sources, allowing sheep operations to the place of forty days, and I assume forty nights, and fencing of tailing ponds.

The Division requests that the livestock mitigation section be rewritten to include exactly that — livestock mitigation. The Division further requests that the BLM clearly state the type and location of range improvements to be made in response to each scenario.

In conclusion, the loss of 1,000 AUMs, though apparently acceptable to the BLM, is unacceptable to the Wyoming Department of Agriculture. This assessment is an example of how cumulative impact is ignored in the EIS process. Those responsible for natural resources in the state must realize that AUMs are declining statewide as a result of federal management decisions. This trend has to be reversed through major range improvement efforts on every affected BLM district.

Thank you for this opportunity to respond to this assessment.

CF/lms

DANIEL N. MILLER, JR.
DIRECTOR AND
STATE GEOLOGIST
DEPUTY DIRECTOR AND
STAFF GEOLOGIST
GARY B. GLASS
STAFF GEOLOGISTS
RODNEY H. DE BRUIN
W. DAN HAUSEL
DAVID R. LAGESON
ALAN J. VER PLOEG
TECHNICAL EDITOR
DAVID A. COPELAND

E7

THE GEOLOGICAL SURVEY OF WYOMING
UNIVERSITY OF WYOMING
BOX 3008, UNIVERSITY STATION
LARAMIE, WYOMING 82071
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September 15, 1981

Mr. Dick Hartman
State Planning Coordinator
Wyoming State Clearinghouse
232D Capitol Ave.
Cheyenne, Wyoming 82DD2

Dear Mr. Hartman:

Dan Hausel, Deputy Director/Minerals Geologist, has reviewed the Sodium Mineral Development, Rock Springs BLM District (I.D. No. 81-131), and his comments are attached.

If your office or another State agency would like us to re-examine any part of this draft, please feel free to ask.

Sincerely,

James C. Case

James C. Case
Staff Environmental Geologist

Geology - Interpreting the past to provide for the future

MEMORANDUM

To: Dick Hartman, State Planning Coordinator
From: Dan Hausel, Deputy Director
Subject: Sodium Mineral Development

Page 23 - Scenario 6 Under variable number 5 - Development is expected to include six new mines? Is there any documentation for this variable? What or which companies are planning development?

Page 37 - 5th paragraph under "Sodium Minerals" The five minerals that "may be of commerical interest in the future" are so finely disseminated and occur in such minor amounts in the trona and oil shale beds that these would essentially have no potential commercial value.

Page 79 - Solution mines and plants Analysis of impacts of trona solution mining should be comparable to that of uranium solution mining with one main exception. Uranium solution mining extracts yellowcake from permeable arkosic sandstones and therefore leaves no void or cavern. With trona solution mining, the ore that is removed is bedded trona, thus, such a mine may have minor subsidence. A major difference between a solution mine and a conventional mine for trona extraction should be the processing plant. If the solution mine will be using an existing trona refinery, the disturbed surface area will be limited in area.

Page 36 - Under Geology and mineral resources One possible commodity that is not mentioned, is the "remote" possibility of diamonds in this region. Both chrome diopside and pyrope garnet have been found in ant hills in the southern part of the trona-bearing region. These indicator minerals suggest the presence of an ultramafic intrusive or intrusives somewhere in the general region (see: Geological Survey of Wyoming, Report of Invesitgations no. 19, page 4).

ANACONDA Copper Company

F

RECEIVED
OCT 0 [illegible]
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ROCK SPRINGS, WYOMING

September 24, 1981

Sodium EA Team Leader
Bureau of Land Management
Rock Springs District Office
P.O. Box 1869
Rock Springs, WY 82901

Dear Sir:

The Anaconda Copper Company appreciates the opportunity to comment on the BLM Draft Environmental Assessment of Sodium Mineral Development in Rock Springs District, Wyoming.

We agree with the proposed action to issue new competitive leases within the KSLA and prospecting permits outside the trona deposition area. However, a company that is not presently producing in the district would find little opportunity to become a soda ash producer in the Green River basin under any of the several different scenarios suggested in the report. We believe that in order to "promote healthy competition within the industry and to assure a fair return to the public," any development plan for the Green River basin should include the following considerations:

1. Qualified applicants should be granted sodium prospecting permits for areas outside of the KSLA but within the trona deposition area where geologic conditions could be favorable for the economic recovery of trona.

2. The granting of federal leases through competitive bidding should carry with it the right for a company to determine the location, capacity, and type of mine and plant to be constructed consistent with environmental, economic, and engineering considerations.

The Draft Environmental Assessment gives the impression that the seven described scenarios are either the only or the most logical scenarios for any future development in the Green River basin. We feel that in no way should these scenarios be interpreted as the only alternatives, and the final Environmental Assessment should either omit them or state that they are not intended to be specific management guidelines.

Several scenarios in the Draft Environmental Assessment involve expansion of the capacity of existing mines and plants or placement of a limited number of new facilities in areas already under lease. This plan effectively serves to reduce the opportunity for companies without an established property position in the area to become producers in the district. Such restrictions on capacity and placement are not in keeping with the stated objectives of the plan.

Your favorable consideration of these suggestions is greatly appreciated.

Sincerely,

R. W. Knostman

R. W. Knostman, Manager
Industrial Minerals Exploration

RWK/sh

G

Ref: ESD 81 T-286

September 28, 1981

Mr. Donald Sweep
District Manager
Rock Springs District
Bureau of Land Management
P.O. Box 1869
Rock Springs, WY 82901

Dear Mr. Sweep:

Re: Sodium Mineral Development
Draft Environmental Assessment Report

Rocky Mountain Energy has completed its review of the Sodium Mineral Development, Draft Environmental Assessment Report. The materials enclosed herewith identify our specific concerns involving the Bureau's future sodium leasing policy. We appreciate the opportunity to participate in the Bureau's planning process and would be happy to meet with you and your staff to discuss these issues.

Sincerely,

Clark M. Bolser
Manager, Environmental Services

RECEIVED
BLM ROCK SPRINGS
DISTRICT
OCT 06 81

Enclosure

JM	OPER
ADM	SP
O	SO
JMIN	BS
S E	SW
RES /	PINE
ALL PERS	REM

COMMENTS BY ROCKY MOUNTAIN ENERGY

CONCERNING THE

SODIUM MINERAL DEVELOPMENT

DRAFT ENVIRONMENTAL ASSESSMENT

INTRODUCTION

Rocky Mountain Energy (RME) appreciatee the opportunity to comment on the Sodium Mineral Development Draft Environmental Assessment Report (EAR). Since most of the trona deposition area has a checkerboard pattern of land ownership, it is vitally importsnt that the federal, state, and private lsndowners cooperate in planning the best use of the sodium resource.

In reviewing the EAR, we have evaluated the proposed sction and sssessment of impacts keeping in mind the concept of multiple use of public lands. We encourage the Bureau to continue public participation in decisions relating to land use and natural resource developments.

Tahle I-9, Comparison of Long Term Impacts..., illuetrates ths fact that thers is very little difference in the long-term impects when the vsrious alternstivss are compared. It seems that even if the Bureau doea not estahliah a competitive leasing program or prospecting program, impact of a similar magnitude will occur although it will be primarily on land already leased hy the federal government or on privste or state lands. Our evaluation is that if a competitive leasing program is initiated it should not he consldered a major federal action.

The following comments identify our specific concerns which are presented in two parts. Part I is an analysis of the proposed action snd Psrt II is a detailed analysis of the environmental suhject matter.

Part I

SUMMARY OF RME COMMENTS
ON THE PROPOSED ACTION

G

Chapter I

ANALYSIS OF THE PROPOSED ACTION

The proposed sction for future aodium mineral dsvelopment has aeveral aapects thst sre important to insuring thet a reliahle supply of trons will be evailehls in the futurs.

Prompt sction in rsnswing sxisting sodium lseaea ia needed. At the preaent tims, almost all federsl sodium lessas have peassd thsir respective renewal dates. While the Bureau considers the renewal of leaees to be non-discretionsry, uncerteinty exists for operators as long as thsss leeses sre not rsnewed. In many cases, renewals are important to eatsblish reasonahle royeltiea for federel trons snd corresponding revenues for the fsderal government snd ths State of Wyoming.

RME helievss ths iesusnce of sdditionsl lseaea within the KSLA ia only one component to he evsluated in determining the incresse in production which will occur. Equslly as importsnt to growth in natural aods eah production is ths growth in the domeatic snd forsign markets for this materiel. The scenarios prasentad in ths Environmentsl Asssssment sssume e contrihution from aolution mining slthough this technology hae not yet heen proven to relishly produce trona in sn economic manner. As s reault, growth in trona production will he es heevily influsnced by technological and market factors aa by ths aodium lessing policy.

In eddition, we helieve that the propoesd sction should contain a plen for conaolidsting federal trona into blocks througb exchange with privstely (or stste) owned trona reservee within the KSLA. For aome time, the Foreat Servica and the U.S. Fish snd Wildlife Service heve exprsaaed an interest in acquiring trona owned by RME within the Flaming Gorge National Recrastionsl Ares (FGNRA) and the Seedskades Nstionsl Wildlife Refuge (SNWR), respectivsly. RME is willing to exchenge its trona reasrves in these areas for other trons of equel vslue within the KSLA. As part of the propoaad sction, ws would propoee that federal trons locstsd in the KSLA he exchanged for the RME-ownsd trone loceted in the FGNRA and the SNWR. This exchangs is in the public interest for it sllows the federsl governmsnt to mansge trona rsservea in these sress.

RME encouragsa the Bureau to aaaeas the characteristics of the trona depoaits snd consolidsts federsl sactions into logicsl mining units with private snd state-owned resources. This policy is supported for a number of reasons. Of particuler importance is that this policy will promots the visbility of the trons leasing program and will maximize the recovery of the trons reservee.

Applying the Limited Surface Occupsncy Criteria (LSOC) to new lesses, especially to lesse renewals, should he approached cautiously. Several componente of the criteria appear to be

somewhst inconsistent with surface occupancy restrictions applied in conjunction with other resource management programs (e.g. cosl leasing) that are not supported by the current state of knowledge. For example, avoidance of aage grouse nesting and strutting grounds required by the LSOC fails to recognize that impacts to sage grouse habitats can be succesafully mitigated.

Application of the criteria also may fragment mining units to the point thst the remaining resources could no longer be mined economically. Because the KSLA is located on the checkerboard pattern of federal, private, and state ownership, the Bureau's action could effectively condemn private and/or state trona reaarvea. Application of the criteria on the "chackerboard" is particularly troublesome because state law and local land use plana do not recognize these criteria and would allow the aurface to be used for mining activities.

Criterion No. 4 of the LSOC, which addresaes protection of visual and recreational values in the Flaming Gorge National Recreation Area, may limit mineral development far greater than was explained. Appendix 1 states that all of the mapable LSOC restricts surface development on approximately 228,640 scres of the trona depoaition area. Bowever, tha amount of the ares with surface occupsncy restriction could increase by 40,000 to 50,000 acres if the five-mile (foreground-middleground) buffer zone around the Flaming Gorge reaervoir actually became tha restriction boundary. We ancourage the Bureau to follow through on tha intention of avslusting aach leasa or lease group to datsrmine tha potentisl impact on views from the oparating level of the reservoir, rather than placing s flat five-mila limit on surface construction. RME believes that in some cases, surface facilities could be constructed on sections contiguoua with the FGNRA without impacting visual values if there was not a direct line of view from the reservoir. RME's detailed critique is found later in theae comments under the subtitle of Limited Surface Occupancy Criteria.

The list of 93 mitigating measurea (page 118) have been avaluated and compared with the permit requirements of regulatory agencies involved with trona development (see Table 1). RME supports mitigation of significant adverse impacts of trona development; however, requiring mitigation in the form of lease stipulations generally should not be necessary. Most of the mitigstion measures proposed are required by state and federal law administered by other agencies and are routinely included as a condition of the necessary construction and operating permits or compliance programs for mining and refining trona (see Table 1).

Our findinga are contrary to the Bureau's statement that "...these measurea are supplemental to what is already required by various other agencies..." (page 118). We realize that the Bureau is proposing to select only the measures that are relevant to a particular lease for inclusion as stipulations in the lease renewal. We suggeat that the Bureau limit its stipulations only to those matters not regulated by other stste and federal agencies or where the Bureau is mandated by statute or act.

G

Part II

DETAILED RME CDMMENTS

Chapter II

AFFECTED ENVIRONMENT

Dil Shale

The Bureau's mention of the Energy Research and Development Adminiatration (ERDA) is incorrect. The ERDA is no longer in exiatence, but has been reorganized into what is now the Department of Energy (DOE). Although the DOE has conducted in situ research near Green River, that research has concluded and the DOE is in a reclamation mode.

Additionally, we recommend that the Bureau recognize that there are oil shale reserves with shallow overburden in the east edge of the trona deposition area and possibly on the west edge. When evaluating sodium lease applications, consideration should be given to the possible development of oil shale on the same land parcels.

Soils

The general aoils information provided for the regional area is adequate, however, for site specific areas the general soils information would not apply. Bence, we have concerns with information provided in Table II-6 on general soils unit limitations for the KSLA. We assume the soils unit limitations may not have been based on any detailed physical and chemical analysis.

Vegetation

The vegetation description of the affected environment appears to be generally adeguate for the purpose of a regional environmental description. Bowever, information on dominant plants as well as on commonly occurring plants are lacking and need to be provided for site specific analysis. It would also be helpful to the readera if annual production estimation is included in the vegetation type description.

The information provided on threatened and endangered (T/E) plants is incorrect. Of the three speciea indicated as being present within the KSLA, two of them - Stanleya pinnata var. gibberosa, and Aatragalus promianthus are no longer candidates for threatened status (personal communication with R. Dorn -9/14/81) and have already been removed from the threatened status list. The third speciea - Physaria condensata is still on the threatened list. We believe the species does not occur within the KSLA and should therefore be of limited concern.

Terreatrial Wildlife

The overall discussion on wildlife in the affected area seems adeguate. Bowever, more information and studies on a site specific and species specific basis is needed. We have a few concerns with some of the information provided. These are included in the following sections.

Big Game -- It is not clear how the big game crucial winter range designation was ascertained. The pronghorn winter range waa said to be dependent on climatic conditions and snow depoaition (page 51 Trona EAR). In the winter of 1978-1979, the snow covered their traditional winter range and the pronghorn moved further south. This would indicate that the area deaignation should not have been a crucial winter range, but rather a traditional wintering area.

Mule deer usage of the area was said to be infreguent. The mule deer winter range is found in the southern portion of the trona deposition area, as indicated on Map II-3. Based on this interpretation, that area is not crucial winter range and should be eliminated from the Limited Surface Dccupancy Criterion (LSDC).

Elk were reported wintering in the aouthwestern part of the KSLA, but once again no crucial area was mentioned. Based on the above reasons, we feel deciaions to limit surface occupancy and/or aeaaonal use due to big game crucial winter range should be reviewed. If data are inadequate in determining crucial winter range, application of the LSOC should be reserved.

Sage Grouse -- The general rule that sage grouse nest within two miles of their respective strutting grounds often does not apply. An ongoing atudy by RME in the Rawlins BLM district has shown an average distance of 3.84 miles between lek and nest. However, the distances hens moved to the neats ranged from 0.75 to 10.0 miles. Sixty percent of the radioed hena neated more than two miles from their respective strutting grounds. Therefore, the 90 percent figure, cited in the Trona EAR appeara misleading. It should be clarified that 90 percent of the birda found within two miles of the lek doea not include the entire neating population, since hens nesting in areas outside of the two-mile radius were apparently unsurveyed. Further, the probability of finding a nest using only ground aearch methoda would decrease dramatically aa the distance from the lek increased, making nests located greater than one mile from the lek very difficult to verify. Additionally, one of the atrutting grounds shown on Map II-4 appears to be situated in the Flaming Gorge Reservoir. If the lek is near the reservoir, this would only illustrate our reasoning that a two-mile buffer is not uniformly applicable. Grouse are highly selective of nest sites, there is no reason to protect extensive areas that are unsuitable as neating habitat or brood-rearing habitat regardless of how close they are to a sage grouae lek. Sage grouse strutting grounds and nesting areas should be reviewed on a csse-by-case basis.

Socioeconomic Conditions

The overall description of socioeconomic conditions in the area of sodium mineral development appears to be appropriate for a regional environmental assessment. One change the Bureau should consider for the final EAR would be to include data from Lincoln County within the description. While most of the socioeconomic impacts have been and will be located in Sweetwater and Uinta counties, sodium development has caused a small amount of growth in the city of Kemmerer and Lincoln County.

Housing -- The rate of housing vacancies in Rock Springs is given as 3 percent. Our best estimate places the vacancy rate slightly lower at 1.5 to 2.0 percent. Besides the general rate of vacancies, it is more useful if housing availability is evaluated on the basis of type i.e. mobile homes, apartments and single family dwellings. Currently, the main housing shortages in Green River and Rock Springs are in the categories of mobile homes and apartments.

Chapter III

ENVIRONMENTAL CONSEQUENCES
ANALYSIS OP SCENARIOS

Soils

Mention is made of the use of cyanide in processing trona in Scenario 1. We have not identified any trona mining or processing operation in the Green River Basin that uses cyanide. We recommend that this error be corrected in the Final EAR.

Andesitic tuffs and fluorapatites are discussed as being sources of fluorine. Although the text says "(see glossary)," these terms are not identified. It would be useful for those without geologic training to have the definition in the report.

Vegetation

Our principal concern, with respect to the impacts analyzed for each scenario, is the 20 to 50 year time frame required for restoration of stable plant communities on disturbed lands. We believe that adequate reclamation could be accomplished within 5 years of topsoil replacement for grassland areas, and within 15 years for shrublands. Stable plant communities could therefore be established within a 10 to 20 year time frame for most disturbed lands.

We agree with the statement that the postmining vegetative community on the tailings area is not expected to be returned to the previous ecosystem. Earlier in the text it was stated that playas were frequently chosen as sites for mine waste disposal (tailings, etc.), due to their depression like nature and poor soil quality. These soils contain accumulated salts which prevent most vegetative growth. This indicates that the premining vegetation in the tailings area would be considered as very poor. We are confident that ongoing tailings pond reclamation research will find a viable method for revegetating or permanently stabilizing the tailings areas.

The assumption that sodium compounds and hydrofluorides were the causal agents involved in the deterioration of plant communities is not substantiated by adequate data. Due to the lack of knowledge on the amount of sodium present in the native soils, we question the degree of impact which introduced sodium compounds might have on the plant communities. Soil tests that have been taken on undisturbed playa soils do not substantiate the assumption that hydrofluorides were the cause of degradation to plant communities because of the presence of unusually high levels of fluorides in the native soils.

We feel further research is needed to adequately assess the impact of trona fallout on the plant communities and the number of acreages involved.

It is true that no matter which alternative is chosen for the leasing decision process, there will be some loss of vegetation. However, vegetation loss due to mining is only temporary. The overall vegetation disturbance will be insignificant because only 1 to 2 percent of the KSLA area will be affected.

Terrestrial Wildlife

Mammals -- We feel further study and documentation is required to adequately assess the big game habitat issue. Impacts to big game winter ranges of the magnitude indicated in Chapter II, which would calculate to 64.12 acres/antelope and 150.0 acres/deer, could be mitigated with off-site range improvement projects.

It is unclear how the number of impacted antelope cited in each scenario was calculated if the areas are not at carrying capacity. The "estimated 86 wintering antelope" displaced in scenario one would not be adversely affected if the surrounding area is at carrying capacity. Babitat improvement projects would only be needed if alternative wintering areas are indeed at carrying capacity.

Birds -- The loss of migratory waterfowl as a result of their use of the tailings ponds requires further research. An effective mitigation technique may be found to prevent these losses as an alternative to bird halfway houses.

In reference to the concerns presented in the scenarios on impacts to raptors, we have the following recommendations. Slow speed limits could be enforced on the roads to reduce the number of road kills. Removal of large road kills could aid in reducing the concentrations of raptors along the roads. Artificial nest structures could be constructed to attract raptors, providing alternative sites away from disturbance during the nesting period. Call (1979) and Olendorff, et. al. (1980) have reported successful nesting on artificial structures for 11 of the 18 species listed in Chapter II. Properly designed powerlines would offset the electrocution problems (personal communication M. Nelson).

Aquatic Wildlife

A number of concerns were mentioned in the scenario one analysis. Included in the following are a few mitigation considerations. To protect minimum flows, during drought years or in late summer or fall, water storage could be considered during the periods of high flow. This could be regulated to minimize

eutrophication and reduction of habitat quality. Special design features could also be investigated to prevent the impact on post larvae and young fish from water intake structures used to supply refineries or other structures requiring a cooling process.

In light of these and other potential mitigation strategies, the Bureau should recognize that management of stream flows is dictated by other state and federal agencies, primarily through control of the Fontenelle Reservoir. Mitigation measures should be evaluated with the cooperation of the appropriate agencies and only be applied where necessary and reasonable. The Fontenelle Reservoir was created as a multiple use project, not only to increase fisheries, but to provide a water supply system. Management situations must strike a balance between water uses in keeping with a multiple use approach. The Bureau must consider the economic realization that controlled use of water and mitigation stipulations could place an undue financial burden on industry.

Livestock Grazing

We believe that mining under all alternatives would not have any significant impact on livestock and rangelands because of the insignificant amount of forage that will be removed. A total of 60,970 AUM's has been assessed as the AUM amount available in the trona deposition area. Mining under the different scenarios is expected to remove approximately 380 to 727 AUM's. Some of these AUM's that will be removed could be replaced in a short time through mitigation measures such as range improvement through fertilization, which would increase forage production and palatability of certain grasses and forbs.

We would also like to note that removal of 380 to 727 AUM's is for all expected disturbance and will occur over a long period of time. In the first few years, only about 30 to 40 percent of the above AUM's are expected to be lost.

In reference to adverse impact on lambing operations in the spring, we would like to point out that the only significant lambing area identified for the KSLA area is in the extreme southern edge of the KSLA boundary (MAP A1-1). The southern edge of the KSLA is not likely to have significant mining operations, hence lambing operations should not be affected. This is corroborated by the discussion presented in Chapter II, pg. 61 under Livestock Grazing.

We would also like to point out that when lease applications are submitted, a working relationship could be developed between the applicant, the BLM official, and the livestock permitee. Lambing areas or livestock grazing could be relocated to satisfy both the livestock owner and lease applicant.

Water Resources

We recognize that in the absence of scientific and technical information, it is difficult to accurately quantify potential impacts to water resources. However, we would encourage the Bureau to continue to substantiate water resource impact projections through consultation with appropriate state and federal agencies. Agencies such as the U.S. Geological Survey, the Bureau of Recreation, the Wyoming Department of Environmental Quality, the State Engineer and Board of Control, and the Wyoming Department of Economic Planning and Development have been delegated responsibility to administer water resource programs, hence they have considerable experience in water resources impact analysis.

Further investigation will be necessary to properly address the concerns identified in the EAR. For instance, the Bureau has projected that degradation to groundwater would occur during all phases of trona development. Bowever, given the proper controls during prospecting, exploration, and development of trona, there is little opportunity for ground water contamination to a resource that is of poor quality in its natural state. Furthermore, the lack of knowledge regarding solution mining techniques makes impact projections highly speculative at this date. The Bureau should recognize that other federal agencies have specific expertise in dealing with water resources. Most notably, the Environmental Protection Agency through implementation of the Underground Injection Control Program will carefully regulate the environmental effects of solution mining.

Additionally, many impacts identified in the Environmental Assessment Report are not likely to occur given Wyoming mining law. Regulations have been promulgated that provide for stringent permit requirements, rigid environmental performance standards and effluent limitations, bonding requirements, effective reclamation procedures, and rigorous monitoring requirements. Conseguently, water pollution control strategies have placed stringent controls upon industry to effectively eliminate adverse impacts to the surface and groundwater resources.

Socioeconomic Impacts

One correction should be made in the description of the Rock Springs sewage treatment capacity. Although the recently constructed sewage treatment facility is operating at capacity, funds have been budgeted for expansion of the facility to accommodate another 3,000 residential hook-ups. A temporary treatment facility is being operated to provide additional capacity for current demand.

Literature Cited

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Personal Communications

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Chapter III

ENVIRONMENTAL CONSEQUENCES
MITIGATING MEASURES

RME has made a comparison of the 93 mitigating measures proposed by the Bureau with permit requirements and programs administered by other agencies. Table 1 shows the comparison and illustrates that most of the measures are duplications of existing requirements. Unfortunately, the Bureau chose to include only those items which it proposes to enforce as mineral lease stipulations. We suggest that BLM list all major mitigation measures (including socioeconomic) whether the Bureau administers them or not. Based on our regulatory comparison, the Bureau should implement only those few mitigation measures which are not under the jurisdiction of other state and federal agencies.

Only a few socioeconomic mitigation measures were mentioned in this section. Recently constructed trona facilities have been required to give assistance to impacted communities by the Wyoming Industrial Siting Council. We believe that the Council and not the Bureau is the appropriate authority to require and enforce a socioeconomic mitigation plan for new trona developments.

The Bureau briefly stated in Chapter I that Sweetwater and Uinta County Commissioners have jurisdiction over land use zoning in the trona deposition area. In addition to zoning responsibilities, county and city government agencies provide a major means of planning and providing community infrastructure. Coordination between the BLM, county, and local governments as well as other regulatory agencies can be a significant means of implementing socioeconomic mitigating measures.

Table 1

Proposed Sodium Lease Stipulations
Comparison of Jurisdictional Overlap

Stipulation	Agency With Overlapping Jurisdiction	Permit That Will be Duplicated by Stipulation Requirements	Comments
AIR QUALITY			
1. Dust control during construction of facilities and rights-of-way.	Wyoming Dept. of Env. Quality, Air Quality Division (AQD)	-Permit to Construct	Air quality general: Regulation of air pollution is best left to the Wyoming Air Quality Division (AQD), which enforces the Federal Clean Air Act and Wyoming Air Quality Regulations. While the air quality mitigation measures that are listed may be useful, selection and enforcement of measures for each trona operation should remain within the role of the AQD.
	AQD	-Prevention of Significant Deterioration Permit (PSD)	
2. All ore or product shipment should be done in covered cars or truck.	AQD AQD AQD	-Permit to Operate -PSD -Wyoming 1979 Implementation Plan for Sweetwater County Nonattainment Area (SIP)	
3. A soil binder should be used on dry portions of tailings ponds to control dust.			Not presently required by the AQD. The air particulates derived from this source is thought to be too small to require regulation.
4. Water sprays or dust binders should be used on temporary or nonpaved road surfaces during periods of heavy use.	AQD AQD AQD	-Permit to Construct -PSD -SIP	
5. Soil stockpiles from plant and tailings pond sites with wind erodibility potential.	AQD Wyoming Dept. of Env. Quality, Land Quality Division (LQD)	-PSD -Permit to Mine	
6. Stockpiles of trona and coal should be located near natural or manmade windbreaks.	LQD AQD AQD	-Permit to Mine -PSD -Permit to Construct	
7. Permanent access roads to plant sites, mine shafts, parking lots, etc. should be paved to eliminate dust from vehicular traffic.	AQD AQD AQD	-Permit to Construct -PSD -SIP	
TOPOGRAPHY			
1. No road, pipeline, buried cable or other major surface disturbing activity should be allowed on slopes greater than 20% unless the Authorized Officer (AO) makes exception.	Bureau of Land Management (BLM)	Right-of-Way Permit	It would seem appropriate to attach this stipulation to a right-of-way grant rather than a lease stipulation.
2. All disturbed areas should be recontoured to blend with the natural topography.	LQD	-Permit to Mine	
GEOLOGY AND MINERAL RESOURCES			
1. Existing sand and gravel pits should be utilized whenever the AO deter- it feasible before new sites are excavated.	LQD LQD LQD	-Permit to Mine -Limited Mining Operations -Notification of Operator	While it is desirable to avoid the proliferation of small gravel pits, BLM should recognize that it is not responsible for managing gravel deposits on private or state lands.
2. Alternate sand and gravel sources should be identified for future use.			This should be a BLM planning objective not a lease stipulation.
PALEONTOLOGY			
1. If paleontological resources are discovered in the course of construction, the activity should cease and the BLM AO should be notified.	LQD State Historic Preservation Office (SHPO)	-Permit to Mine	
SOILS			
1. All disturbed areas should be recontoured, topsoiled, and seeded as soon as possible after construction.	LQD	-Permit to Mine	

Proposed Sodium Lease Stipulations
Comparison of Jurisdictional Overlap

Stipulation	Agency With Overlapping Jurisdiction	Permit That Will be Duplicated by Stipulation Requirements	Comments
SOILS (cont.)			
2. Upon abandonment of plant and mine sites, reclamation should commence immediately.	LQD	-Permit to Mine	LQD requires reclamation to begin within 6 months after mining ceases.
3. Site grading should be carried out only where absolutely required All soils suitable for reclamation should be stockpiled.	LQD	-Permit to Mine	
4. No surface disturbing activities should be allowed during periods of high soil moisture content to avoid excessive rutting of existing roads and/or trails.	BLM	-Right-of-Way Permit	
5. Construction of roads with frozen earth material mixed with snow and ice should not be allowed unless permitted by the AO	BLM	-Right-of-Way Permit	
6. Loading facilities and associated transportation routes should be periodically cleaned through the use of vacuum or other forms of pickup.	Wyoming Dept. of Env. Quality, Solid Waste Management Program (SWM)	-Approved construction and operating plan for solid waste disposal facility	
	SWM	-Promiscuous dumping regulation, Wyoming Solid Waste Regulations	
7. All stockpiles (coal, soda ash, trona, etc.) should be covered or housed to prevent wind or wind-caused contamination of soils.	AQD AQD	-SIP -PSD	The SIP applies to existing operations, requiring that dust control hoods and variable height booms be used for material handling. PSD requirements for new facilities require enclosure of coal stockpiles and other items included in the SIP.
8. Potential soil impacts attributed to trona fallout should be included in facilities siting analysis.	AQD	-Permit to Construct	
9. All solid waste should be disposed of in an authorized sanitary landfill.	SWM	-Approved construction and operating plan for solid waste disposal facility	
	SWM	-Promiscuous dumping regulation Wyoming Solid Waste Regulations	

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Proposed Sodium Lease Stipulations
Comparison of Jurisdictional Overlap

Stipulation	Agency With Overlapping Jurisdiction	Permit That Will be Duplicated by Stipulation Requirements	Comments
SOILS (cont.)			
10. All embankment fill material for reservoir dams should come from within the reservoir area. Borrow pits should be used only for special materials such as clay for core trenches.	Wyoming State Engineer's Office (SEO)	-Permit to Appropriate Surface Water	
11. A soil conservation plan should be prepared for BLM approval for each mine site.	LQD	-Permit to Mine	The LQD requires all of the elements of a soil conservation plan outlined in this stipulation.
12. Water bars should be installed on disturbed and rehabilitated areas to prevent erosion.	LQD	-Permit to Mine	The LQD encourages mining companies to consider the use of a variety of erosion control measures as they may be needed in mine reclamation.
13. Drainages should not be blocked with soil or vegetation.			
14. Road designs and surveys should be approved by the AO before construction.	BLM	-Right-of-Way Permit	
15. Nonpaved roads should meet criteria No. 5 and No. 11 above as well as Air Quality No. 1.			Redundant and unnecessary.
16. Pipeline trenches should be maintained in order to correct settlement and erosion.			This is considered to be good engineering practice commonly in use throughout industries using pipelines. Not necessary as a lease stipulation.
17. Topsoil should be stripped from permanent access roads and railroads.	LQD	-Permit to Mine	This item is a part of Soils Stipulation No. 1.
18. Runoff should be diverted from exposed areas to stabilized channels.	LQD	-Permit to Mine	
19. Porous surfaces (gravel) should be considered as alternatives to asphalt and concrete for use on parking areas, etc. to encourage water infiltration.			The SIP requires that roads near the existing plants and parking areas be hard surfaced for the ease of removing trona dust. This stipulation is in direct conflict with the SIP.
20. Soils contaminated by spills should be disposed of in an authorized dump site.	EPA EPA SWM	-Superfund -Resource Conservation and Recovery Act -Wyoming Solid Waste Management Regulations	

Proposed Sodium Lease Stipulations
Comparison of Jurisdictional Overlap

Stipulation	Agency With Overlapping Jurisdiction	Permit That Will be Duplicated by Stipulation Requirements	Comments
WATER RESOURCES			
1. Discharge of water on public lands would not be permitted without permits from DEQ and authorization from USGS and BLM.	Wyoming Dept. of Env. Quality, Water Quality Division (WQD)	-Permit to Discharge (NPDES)	
2. Existing roads should be used for access to streams, rivers, and reservoirs.	LQD	-Permit to Mine	
3. Plant sites should be designed for "zero discharge concept" through the use of containment ponds.	WQD	-Permit to Discharge (NPDES)	This stipulation appears to be in disagreement with Water Quality No. 1. Which does BLM consider more desirable? EPA, LQD, and WQD prefer zero discharge.
4. Emergency containment ponds should be in place below tailings and containment ponds.	WQD LQD	-Permit to Construct a Wastewater Treatment Facility -Permit to Mine	
5. Water-bearing formations with sufficient quality and potential for beneficial use should be protected.	SEO LQD U.S Environmental Protection Agency (EPA)	-Permit to Appropriate Ground Water -Permit to Mine -Underground Injection Control Permit (UIC)	The Wyoming State Engineer's Office, Groundwater Division directs all of its resources to this objective.
6. Tailings ponds should be impervious to seepage.	WQD SEO LQD	-Permit to Construct a Wastewater Treatment Facility -Permit to Appropriate Surface Water -Permit to Mine	
7. Tailings ponds should designed to withstand two consecutive 100 year floods.	WQD SEO LQD	-Permit to Construct a Wastewater Treatment Facility -Permit to Appropriate Surface Water -Permit to Mine	
8. Contingency plan for tailings failure	WQD SEO LQD	-Permit to Construct a Wastewater Treatment Facility -Permit to Appropriate Surface Water -Permit to Mine	
9. During shaft sinking, any ground water encountered should be grouted off and sealed.			This is considered to be good engineering practice commonly in use througout the mining industry. It is not of sufficient concern to be a lease stipulation.
10. During any prospecting and exploration drilling, BLM and USGS should be notified if black water or flowing artesian water is encountered.	SEO LQD WQD	-Permit to Explore -Potentially, Permit to Discharge	This is a good idea. Additionally, the SEO and LQD should be notified as required by their respective regulations.

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Proposed Sodium Lease Stipulations
Comparison of Jurisdictional Overlap

Stipulation	Agency With Overlapping Jurisdiction	Permit That Will be Duplicated by Stipulation Requirements	Comments
WATER RESOURCES (cont.)			
11. A plan addressing the various aspects of mine dewatering should be submitted.	LQD WQD	-Permit to Mine -NPDES -Wastewater Facility Permit	
12. Culverts and energy dissipation devices should be installed at drainage crossing to accommodate a 10-year flood event.	LQD	-Permit to Mine	
13. Locations of drainage crossings should be specified in the development plan.	LQD	-Permit to Mine	
14. Temporary stream stability structures would be required for siltation control at stream channel crossings.	U.S. Army Corps of Engineers	-Dredge & Fill Permit	This is considered good engineering practice.
15. Any plant, mill, tailings, and sewage lagoons should be at least one-half to one mile from a perennial water body.	LQD	-Permit to Mine	Potential impacts to surface waters are thoroughly addressed in a mine permit application.
16. It should be demonstrated that when solution mining techniques are to be used in trona development, there will be no interformation mixing of water.	LQD LQD	-Permit to Mine -In Situ Research and Development License	This stipulation assumes that the mining technique to be used is known when a lease is issued. This issue is important only when a water-bearing formation (that has potential for beneficial use) is close to the mining area. In the areas where solution mining currently is being tested, it is doubtful that the water in adjacent formations would ever be beneficially used because it has poor quality, has small yields, and is deep below the ground surface.
17. An intensive hydrogeologic study of proposed mine areas should be included in the premining plan.	LQD LQD	-Permit to Mine -In Situ Research and Development License	This stipulation appears to substantially overlap Water Resources Stipulation No. 11 as well the Land Quality Division Requirements.
18. Solution mining should be shown to have no effect on alluvial deposits when mining close to a natural drainage.	LQD LQD	-Permit to Mine -In Situ Research and Development License	This item could be consolidated with Water Resources Stipulations No. 11 and No. 17.

Proposed Sodium Lease Stipulations
Comparison of Jurisdictional Overlap

Stipulation	Agency With Overlapping Jurisdiction	Permit That Will be Duplicated by Stipulation Requirements	Comments
WATER RESOURCES (cont.)			
19. Establishment of reporting procedures should be developed in the event a well net shows contamination.	LQD LQD EPA	-Permit to Mine -In Situ Research and Development License -Underground Injection Control Regulations	This matter has been addressed by the LQD in both solution mine research and development programs that are operating.
20. In the event ground water is contaminated, "Ground Water Sweep," chemical treatments or reverse osmosis should be used for restoration.	LQD LQD EPA	-Permit to Mine -In Situ Research and Development License -Underground Injection Control Regulations	These are viable alternatives where ground water restoration is needed. However, if the ground water is of poor quality prior to mining (i.e. high salinity, high TDS), there would be little need to restore the water to baseline conditions. Requirements such as these are not appropriate for lease stipulations. Further, industry should decide what technology should be used.
VEGETATION			
1. Impacts of trona fallout	AQD AQD AQD	-State Implementation Plan -Permit to Construct -PSD	DEQ has primacy to implement federal air quality programs designed to reduce air emissions and associated environmental impacts.
2. Rehabilitation of disturbed areas	LQD	-Permit to Mine	All associated impacts of mining and exploration activities are regulated by DEQ. The applicant must prepare detailed reclamation plans and must be bonded to assure adequate reclamation.
3. Threatened and endangered species clearance	LQD U.S. Fish & Wildlife Service (USFWS)	-Permit to Mine	The U.S. Fish & Wildlife Service (USFWS) maintains a list of all threatened and endangered (T&E) species. Potential impacts of mining, in addition to facilities construction, within the habitat of any T&E must be addressed in the mine plan.
4. Right-of-way stipulations clearing of vegetation	BLM	-Right-of-Way Permit	Leasing stipulations for vegetation would be duplicative with the right-of-way permitting process (43 CFR Part 2800).
5. Seasonal restrictions and right-of-way construction	BLM	-Right-of-Way Permit	Leasing stipulations for vegetation would be duplicative with the right-of-way permitting process (43 CFR Part 2800).
6. Preconstruction vegetation baseline data	LQD	-Permit to Mine	Baseline vegetation studies and impact analysis must be described as part of a mining permit application.
7. Tailings pond reclamation experimentation	LQD	-Permit to Mine	Regulations to assure tailings pond reclamation are implemented by DEQ. DEQ may also require additional studies if reclamation is not adequate.
8. Reseeding disturbed areas	LQD	-Permit to Mine	A reclamation plan must be addressed in a mine permit application.

Proposed Sodium Lease Stipulations
Comparison of Jurisdictional Overlap

Stipulation	Agency With Overlapping Jurisdiction	Permit That Will be Duplicated by Stipulation Requirements	Comments
WILDLIFE			
1. Threatened and endangered species clearance	Same as Vegetation Stipulation No. 3		
2. Black-footed ferret surveys	LQD USFWS	-Permit to Mine	Contained in LQD rules and regulations are procedures for conducting ferret surveys which are part of the mine planning process. Additionally, the Wyoming Game & Fish Department (WGFD) reviews mine permit applications to determine adequacy of mitigation measures for each project.
3. No construction within one mile of Green River during raptor nesting period	LQD USFWS	-Permit to Mine	Identification of nest sites, potential impacts, and mitigation strategies for raptors are evaluated in the wildlife assessment of a mine plan. LQD is not likely to share BLM's extreme view and will only protect areas that are proven to be important to nesting. Surely all of the Green River is not a nesting area.
4. Big game habitat improvement projects	LQD	-Permit to Mine	Habitat disturbance resulting from a mine and ancillary facilities must be addressed in terms of wildlife-oriented reclamation and mitigation strategies.
5. Fencing standards for wildlife protection for hazardous areas	LQD	-Permit to Mine	The LQD has recognized this problem and adopted "Land Quality Guideline No. 10" to deal specifically with this issue in the mine plan.
6. Methods to prevent waterfowl use of tailings ponds	LQD	-Permit to Mine	LQD, WGFD, and current trona operators have evaluated this problem. As part of wildlife mitigation strategies, mine plans must assess methods of preventing waterfowl use of tailings ponds.
7. Waterfowl halfway houses	LQD	-Permit to Mine	Waterfowl rehabilitation methods are likely to be incorporated as mitigation measures in the mine plan.
8. No surface disturbance around sage grouse strutting areas	LQD	-Permit to Mine	Component of wildlife assessment.
AQUATIC WILDLIFE			
1. Reduction of water withdrawal needs during low flow periods	LQD USFWS SEO U.S. Bureau of Recreation Dept. of Economic Planning & Development (DEPAD)	-Permit to Mine	Water use and potential impacts to aquatic wildlife are thoroughly addressed in the mine plan.
2. Instream boulder placements	LQD	-Permit to Mine	Habitat offsets and improvements are part of mine planning mitigation strategies.
3. Fishery alteration below Big Island Bridge	Same as above		

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Proposed Sodium Lease Stipulations
Comparison of Jurisdictional Overlap

Stipulation	Agency With Overlapping Jurisdiction	Permit That Will be Duplicated by Stipulation Requirements	Comments
WILD HORSES			
1. No utilization of stock watering sources	SEO	-Permit to Appropriate	The SEO evaluates requests for water appropriation and can authorize changes in beneficial uses of water.
2. Fencing of all tailings ponds	Same as Wildlife Stipulation No. 5		
3. Visibility protection for White Mountain Wild Horse Management Area			
CULTURAL RESOURCES			
1. Cultural inventory requirements	LQD	-Permit to Mine	BLM is recognized as the lead agency in managing cultural resources on public lands. Cultural resources clearance, including field surveys are required by state law and addressed in the mine plan.
2. Preservation of well preserved wagon ruts within ¼ mile			See RME text for comments on the Limited Surface Occupancy Section of the EAR.
3. Prior clearance must be given when previously identified areas are to be entered.			This stipulation is vague and cannot be evaluated.
4. Archaeological monitoring of construction in alluvium deposit areas			
5. Buffer zones for cultural sites			The type of restriction on activity within the ¼ mile buffer zone should be explained.
6. Historic trail crossing requirements			
VISUAL RESOURCES			
1. Painting visible structures with natural blending colors			
2. Limited surface occupancy within foreground-middleground from the Flaming Gorge			See RME text for comments on the Limited Surface Occupancy Section of the EAR.
3. Developments are subject to Visual Contrast Rating			See RME text for comments on the Limited Surface Occupancy Section of the EAR.

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Proposed Sodium Lease Stipulations
Comparison of Jurisdictional Overlap

Stipulation	Agency With Overlapping Jurisdiction	Permit That Will be Duplicated by Stipulation Requirements	Comments
VISUAL RESOURCES (cont.)			
4. Developments should be designed to meet VRM Class Standards.			
WILDERNESS			
1. Interim wilderness guidelines should be followed			
RECREATION RESOURCES			
1. Improved access for recreation			This is a good idea.
2. Minimize loss of rock hounding areas			
LIVESTOCK			
1. No utilization of developed stock watering sources			See comment on the Wild Horses Stipulation No. 1.
2. Seasonal development restrictions in lambing areas			
3. Fencing of all tailings ponds	LQD	-Permit to Mine	
LAND USES			
1. All rights-of-way should follow existing corridors	BLM	-Right-of-Way Permit	

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ENVIRONMENTAL CONSEQUENCES
MONITORING PROGRAMS

The environmental monitoring program proposed in Chapter III aasumes that there are major environmental impacta caused by trona development that reguire long-term monitoring. We believe that a more aystematic approach be taken to determine the need for long-term monitoring. Our recommendation ia that a phaaed approach be taken baaed on scientific method to determine what are the specific problema, as the first phaae. A second phase would be to develop a monitoring plan (long-term or ahort-term) to meet the specific problems identified in phase one. Phaae three would be to implement the monitoring plan. The Bureau's propoaal has bypassed phase one and haa proceeded to phaae two assuming that there is a massive deatruction of vegetation communitiea due to trona fallout.

Since baseline soils and vegetation data are not available from the early days of trona mining the premining conditions have to be approximated. The rate of trona fallout is decreasing over time due to retrofitting of air pollution controls on the older plants as reguired by the State Implementation Plan for the Trona Nonattainment area. These factors and many others have to be considered when deaigning an appropriate monitoring plan.

ENVIRONMENTAL CONSEQUENCES
UNAVOIDABLE ADVERSE IMPACTS

Wildlife

In reference to the concern of vegetation rehabilitation, we would like to point out that native species may be reatored by means other than natural succession or invasion. The wildlife habitat is recoverable. Reclamation plana ahould be designed to meet postmining land usea.

Additional reaearch may be warranted to determine the best manner of preventing waterfowl from landing on tailinga ponda.

Livestock

The Bureau estimates that 134 AUM's per plant aite would be loat during the firat 10 years of the plant sitea. The figure, 134 AUM's, translates to 11 cows that would be displaced per year. We feel impacta of trona davelopment would therefore be minimal since mitigation through relocation and habitat improvement projecta could easily support 11 diaplaced animals.

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LIMITED SURFACE OCCUPANCY CRITERIA

1. Sage Grouae

In view of recent coal leasing deciaiona made by the Rock Springs Oiatrict Office, we believe there are mitigation alternativea available to offset adverse impacta to sage grouse atrutting and nesting areas. The Management Framework Plan (MFP) proposed decisions for the Big Sandy and Salt Wells reaource areas recommended that no areas were to be excluded from surface mining of coal baaed on sage grouse lek or nest locations. The justification for this decision is contained in the Salt Wella (MFP) background document (Unsuitability Criterion No. 15, Part 2, Exemptions) which states, "it was the judgment of the BLM that the sage grouae strutting grounds could be moved to an area outside of the coal areas by trapping, relocation, and by developing new water aources." We support this decision and encourage the Bureau to implement a similar policy in applying Criterion No. 1 of the Limited Surface Occupancy Criteria. Mitigation alternatives should be evaluated on case-by-caae analysis of proposed impacta.

2. Historic Trails

The extension of a ¼ mile buffer around all historic trails and aitea seems excesaive and should only be applied on a site specific basis in selected cases. We recommend that the Bureau evaluate the significance of a hiatorical feature before measures are taken to protect that reaource. Guiding principles in determining protection standards should include terrain features, user volume, nature and duration of the historical reaource (i.e. there may be no visible signs of a trail route), and land ownership patterna. A standard buffer zone ia inappropriate and should be adjusted with reapect to the local environmental conditions.

3. Water Resources

We recommend that this criterion be expanded upon to include a proviaion for case-by-case analyaia of the proposed development before the LSOC is applied. The relative significance of the disturbance should be addressed in light of potential mitigation alternatives that would eliminate adverse visual, recreational and water quality impacta. Additionally, the Bureau muat recognize that uae of valid water righta ahould not be inhibited by this criterion.

4. Visual Resources

Criterion No. 4 could have the effect of creating a five mile limited use buffer area around Flaming Gorge Reservoir for protection of visual resources. We are vitally concerned with this proposal becauae of its broad acope and subjective nature. Included within thia buffer area are several thousand acres of federal, state, and private landa. Although thia criterion applies to federal lands, the intervening atate and private landa would undoubtedly be affected. It ia important to remember that underground mining methoda atill reguire aurface facilitiea, which cannot alwaya be located on non-federal lands. To reatrict aurface development could effectively restrict mining potential.

The Bureau eatimatea that 22B,640 acres of the Trona Oepoaition Area ia currently claaaified aa Limited Surface Occupancy. Bowever, this doea not aeem to include Criterion No. 4 which could increase the combined Limited Surface Occupancy by 40,000 to 50,000 additional acres of BLM land. Since trona development and viaual reaources are said to be incompatible, it will be important that reaources are objectively evaluated. The following points are of particular concern:

- o The Viaual Resource Management (VRM) ayatem is the basia for analyaia of development levels. The VRM aystem should be a planning tool to achieve optimum facilitiea design and location within the middleground-foreground of the Flaming Gorge Reservoir and not a mechanism to totally eliminate development.
- o Viaual contraata should not only be rated upon the uniqueness of a characteristic landacape, but also upon an area's significance from critical viewpoints.
- o The logical development of existing leasing activities within the five miles of Flaming Gorge could be jeopardized.
- o Where visual resource conflicts cannot be avoided, we recommend that land exchangea be evaluated as a mitigation atrategy.

According to the Oraft Environmental Statement, Development of Coal Resources in Southwestern Wyoming, the area encompaaaed by the Criterion No. 4 recommendation ia rated as VRM claaaes III and IV. The guidance for managing the VRM claaaea is contained in the BLM Manual-B400. Although the manual specifiea varying degrees of viaual contrast based upon the VRM claaa deaignations, Part B411.6 atates that "structures located in the foreground distance zone (0-½ mile) often create a contrast that exceeds the VRM Class II, III, and IV ratings." Class III and IV

sreas do not generally preclude development, but provide guidance for design of structures in a way that would harmonize with the surrounding environment. Based upon this interpretation, the proposed five mile protection zone seems excessive.

Secondly, a landscape alone should not dictste visual contrast levels. Within the context of the manual, visual contrasts are also rated by the number of potential viewers, viewing distance, angle of the view, and the duration of the view. Areas that sre not noticeable from critical viewpoints are more tolerant to visual contrast and should be managed accordingly. Certainly, a large proportion of the five mile buffer area cannot be seen from the 6040 operating pool elevation because of topogrsphic barriers.

The Bureau appears to be recommending this criterion before a plan for implementation has been developed. Within five miles of the Flaming Gorge operating pool, there are 20 state leases, 14 competitive lease areas, 19 existing federal leases, and 8 preference right lease applications. The logical development of these leases could be jeopardized by application of Criterion 4. We suggest that before implementing this policy, the Bureau has a responsibility to the lease holders to specifically identify visually sensitive areas. In defining sensitive viewpoints, we further encourage a rule of reason be applied to properly balance loss of economic opportunities. The VRM system seems to be tailored for surface disturbances such as roads or pipelines where relocation is a feasible alternstive to achieve an acceptable visual contrast. Trona mining, however, Is far less flexible in relocation potential. The surfsce facilities must accompany the minersl deposit, therefore, by limiting surface disturbance, mining would be prohibitive. Further, development activities on adjacent privste lands should be considered in criterion application. Without recognizing surface developments on private lands would clearly make protection on federal lands ineffectusl. Criterion 4 should apply to those areas that are close to the Flaming Gorge, that are visually sensitive and where a contiguous zone of protection can be guaranteed. Particular concern should be given to existing lease sreas to identify locations appropriate for surface development.

Finslly, there will undoubtedly be visually sensitive areas that will conflict with trona development. As a means of overcoming these unavoidable conflicts, we strongly recommend that the Bureau evaluate land exchange opportunities. The exchange of federal minerals and surface rights for egually valued privste rights could effectively eliminate conflicts. Trona production could be concentrated in logicsl mining units where environmental conditions are more conducive to development.

5. Wilderness Study Area

We recommend that the Buresu elaborate further upon this criterion to indicate thst nonimpairment stipulations are only applicable to the lands within the boundaries of Wilderness Study Areas (WSA). Lands adjacent to WSA's are not subject to Interim Management Policy snd Guidelines.

6. Big Game Wintering Areas

We are in agreement that hsbitat improvement projects are an effective means to offset impacts to big game species. However, we would encourage the Buresu not to limit mitigation potential to surface facilities indicated in the criterion (rosds, rsilroads, etc.), but consider mitigstion for all related surface development associated with plant construction. Further, it is not clear from the terrestrial wildlife assessment in Chapter II whether Criterion 6 is being applied solely to crucial winter ranges or if traditional winter ranges are also being included. We recommend that the Bureau review crucial winter range designations as well as the respective carrying capacities in the Trona Deposition Area.

8. Hesvy Fog Conditions

Topographic and meteorologic conditions in the Green River Valley are naturally amenable to a high incidence of fog events. Bistorically, industrial activities in the area have tended to accentuate these conditions through stack emissions. However, with the advent of regulstions to enhsnce air guality, industry has been reguired to limit emissions of air effluents. Pollution control technology is now very effective in assuring the maintenance of the air quality standards, therefore, industries' contribution to fog and visibility problems has diminished substantially in recent years. Application of Criterion No. 8 should be made in deference to this situation, thereby industrial siting constrsints would be negligible.

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FMC

October 8, 1981

Bureau of Land Management
Rock Springs Oistrict Office
c/o Mr. Ron Hurt
Sodium EA Team Leader
P.O. Box 1869
Rock Springs, Wyoming 82901

Oear Ron:

First we would like to thank you for the extension of the deadline for comments on the draft Bureau of Land Management Sodium Mineral Oevelopment Environmental Assessment. We sincerely hope that our unavoidable delay in submitting these comments has not inconvenienced you.

Our critique is presented under four headings or categories. They are:

I. Structural Errors - these represent omissions, or incorrect data calculations.

II. Oata Errors - these include misinterpretations caused by data presentation methods, and misinformation.

III. Unsubstantiated Biases - these are areas where we feel the presentation of data and conditions are unnecessarily negative.

We fully understand that the BLM assessment was to be on a worse case basis but feel this still requires the scenarios to be probable and realistic.

IV. General Comments - these concern statements or proposals which cannot be questioned regarding their accuracy or bias, but which we feel deserve comment.

I. Structural Errors:

Pg 46, P4 Reference is made to Appendix #4 for water quality. It should be Appendix #5.

Pg 86, P6 Reference is made to the glossary for terms "andesitic tuffs and fluorapatites". They are not there.

Pg 90, P1 Mammals. Reference is made to the glossary for "human harrassment". Term is not there. This term is referred to again on Pg 92, P2 under WILO HORSES.

Pg 121, P4 Wildlife. The term "guzzlers" is not universal and should, we feel, be in the glossary.

Pg 106 Scenario Three, Air Quality. This section refers twice to increasing concentrations of PSO. We believe it's meant to be TSP.

Pg 78 Table III-1 gives the maximum/minimum year 2000 soda ash production water use requirement as being 52,743 acre-feet/year and 45,894 acre-feet/year respectively. On Pg 90, where the impacts of soda ash industry expansion are being discussed, "Sodium related flow reductions . . ." which is taken to mean the soda ash industry, as it's been connotated to mean throughout the report, ". . . would amount to 70-80 CFS . . ." From Table III-1 pg 78 they are 63.4 - 72.9 CFS not 70-80.

II. Oata Errors.

Pg 44 Surface Water

The draft connotes that the Upper Colorado River Compact and the Bureau of Reclamation list Wyoming's Green River water allotment as 805,000 ac-ft/yr. It also lists the average annual flow for the Green River as 369,600 ac-ft/yr at Oaniel, Wyoming. This makes the allotment figure 435,000 ac-ft/yr more than what is available.

This apparent discrepancy also comes under our third category critique, data biases, and we repeat our concern that worse case conditions should depict probable, real life situations. In this case the average river flow is given as 369,600 ac-ft/yr. This is the correct

figure for flows at Warren Bridge near Daniel which is near the head water of the Green River. When the year 2000 expanded soda ash industrial water requirements (45,894 - 52,743 ac-ft/yr) are compared to this figure they appear significant. The draft indicates that these withdrawls will so severely impact the river that the trout habitat will be destroyed.

In looking at the U.S.G.S. report Water Resources Data for Wyoming 1979, WY-79-2, Vol. -2, page 114, the figure of 369,600 ac-ft/yr at Daniel is correct. However, the average flow near Green River, which is much closer to the actual water withdrawl points associated with the KSLA is, for a period of record of 29 years, 1,234,000 ac-ft/yr. When compared to this figure the future 51,000-58,000 ac-ft/yr usage is insignificant (<5%) and more accurately depicts actual conditions.

Pg 55 Cultural, Archeology. In this section it is reported that 13,745 acres have been surveyed for archeological sites in the KSLA and that 350 sites have been located giving a average site density of 21.5 sites/square mile for this area. If the data is correct

350 sites/13,745 acres = 350 sites/21.5 square miles =

16.3 sites/square mile not 21.5.

Pg 90 Birds P6 mentions that electric power lines can electrocute large birds. There have been reports made in various newspapers that economical control devices to prevent this have been developed and are being used throughout the state. This fact should be mentioned here to mitigate the negativeness of this "stated" impact.

Pg 44 P2 The statement is made that trona processing represents a tap on ground water resources. To our knowledge none of the trona processing plants use groundwater for their process water or any other purpose.

Pg 88 P (d) Indicates that 85% of the TSP emissions found down wind from the existing soda ash companies contains sodium compounds (Na_2CO_3, $NaHCO_3$, raw trona) and that the other 15% was insoldble matter such as clays or other impurities. It is claimed that this information resulted from conversations with Mr. Dee Peverley of FMC as well as other industry personnel.

We cannot comment on the other industry persons, but Mr. Peverley recalls talking with BLM personnel, but not about chemical constiuents of the TSP emissions. We believe that your reference relates to the fact that the mined ore consists of about 85% sodium compounds and 15% insolubles, but not TSP fugitive emissions.

Pg 92 Impacts to Aquatic Wildlife. In this section the impact of increased stream sedimentation levels and dissolved solids concentrations are projected to occur from new plant site runoff. This impact should not be listed. The Wyoming DEQ and Federal EPA require that all plant area runoff be contained on site and used or placed in evaporation/tailings impoundments in order to achieve compliance with the "zero" discharge NPDES permit.

III. Unsubstantiated Biases.

Pg 92 Impacts to Aquatic Wildlife

The statement that increased industrial water usage induced 'low flows' would increase sediment, therefore increasing aquatic plant growth, thus increasing BOD levels and reducing the DO is highly speculative and an unnecessary attempt to intensify the negative impact of industrial expansion.

This section also implies that a very serious threat to the Green River fish populations will result through the construction of new plant water intake structures. If necessary these structures can be designed to minimize any threat to fish. However, even without such precautions the impact of these structures is so insignificant that to include it as such, again represents an unsubstantiated negative bias.

IV. General Comments

The regulatory burden on industry today has reached such proportions as to cause free market competition to be based on how efficiently an industry can meet its regulatory requirements rather than how efficiently it can produce its products. FMC does not argue against the case for environmental protection, but strongly opposes the ludicrous redundancy of multiple agency

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requirements which set forth a myriad of repetitious regulations protecting the same thing. FMC also resists regulations which require large expenditures of capital for a miniscule amount of protection. The mitigating measures developed by the BLM start on page 118 and continue to page 123.

It states that these are supplemental to what is already required by other agencies. Unfortunately they are also repetitive. Examples include: Seeding and revegetation requirements, topsoil stockpiling, air quality control measures; nearly all the measures listed are addressed by other agency regulations. Many of those which are not, have been judged either as economically unfeasible or as not having been proven to be effective. For example:

1. Water Resources #4 Pg 120 calls for emergency containment ponds. Recently the Wyoming DEQ proposed such a regulation and in a hearing before the Wyoming Environmental Quality Council it was rejected on the basis of its extreme cost for a low risk condition.

2. Under this same heading proposal #20 requires the rectification of a contaminated aquifer by flushing the aquifer with fresh water, chemically treating the system or using reverse osmosis and reinjection. No mention is made as to whether or not the aquifer needs to be qualified as good or bad. Also, none of these methods have proven to be very effective at restoring a good "fresh water" aquifer and all are costly corrective measures.

In conclusion we would like to once again thank the BLM district office for granting us the extension in order to enable us to comment on this draft. FMC has and will continue to be committed to the protection of our natural environment. We are proud of

our reputation as being environmentally sensitive and plan to continue our efforts .

Sincerely,

WK Nash
Sr. Environmental Engineer

WKN:mlr

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RECEIVED
OCT 1 - -
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ROCK SPRINGS, WYOMING

Vulcan Materials Company

P O BOX 7497 • BIRMINGHAM, ALABAMA 35253 • TELEPHONE 205 877-3213

MELVIN E. CLARE

September 30, 1981

U. S. Department of Interior
Bureau of Land Management
District Office
Post Office Box 1869
Rock Springs, Wyoming 82901

Ref. 1792(420)

Attention: Sodium EA Team Leader

Gentlemen:

In reply to your open letter of August 7 relating to the draft of the environmental assessment study on sodium mineral development in western Wyoming, we apologize for being late with our comments. Your report and letter to us were misplaced and came to light only this week.

First we must congratulate you on assembling an enormous volume of useful information that bear on the subject in this one report.

We have no particular comment on the presentation of the facts. On most of the points covered, your investigators would certainly appear to be much better informed than are we.

We would like to raise a couple of questions with regard to assumptions and policy formation.

In regard to assumptions, we think it might have been appropriate to include a scenario which presumes that all of the growth in the soda ash industry after 1990 would be via solution mining and the new technology now being developed. If our own estimates are correct and some of the public pronouncements by FMC are borne out by a later experience, it could well be presumed that the new technology offers sufficient economic inducement to gradually phase out the older plants over a period of years.

If such a scenario were undertaken, the lower levels of employment, energy consumption, water requirements and environmental change could have a profound effect on some of your forecasts for the year 2000 and beyond.

U. S. Department of Interior
September 30, 1981
Page Two

Secondly, in regard to leasing policy we would favor a program which included the following points:

1. Relatively unlimited issuance of prospecting permits outside the trona deposition area. However, we would suggest more stringent surveillance over such permits to make sure that some action was ongoing which would benefit the public before the permits were extended or converted into preference right leases. Then preference right leases should not be renewed after an initial term (of say 20 years) without further evidence of commercial development.

2. We believe that new competitive leases within the KSLA should be made available but on carefully prescribed terms including:

   a) Bids should not be on individual sections, but on parcels of land large enough to be an economical mining unit to provide at least a 50 years supply of minable reserves at a competitive production rate.

   b) Royalties under the lease should be at a competitive rate with existing leases (say 5%).

   c) Bidders should be qualified before being allowed to bid, as on most other government contracts. For example, an individual or a corporation should demonstrate to the satisfaction of the BLM that it has the people, technology and financial resources to develop the minerals into a commerical venture.

   d) The bid would merely be an offer, supported by a bond, to enter into a normal lease agreement plus an advance bonus.

   e) The lease would be terminated at the end of 20 years unless the lessee could show substantial progress toward a commercial venture by that time.

   f) In the event the lease were sold by the lessee, the right and obligations of the new owner would be carefully prescribed in advance by the BLM.

   g) The number of acres under lease owned by an individual or a corporation (including individuals acting as nominees for corporations) would be limited as it is now.

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Page Three

   h) There would be only nominal restriction on owners of leases buying, selling or exchanging individual parcels in order to obtain a more logical mining pattern.

   i) The BLM would not arbitrarily limit the number of parcels offered for sale providing they met the above conditions.

   j) The composition of a parcel offered could be influenced by the suggestion of would be bidders who would prefer a particular configuration of sections.

   k) All bids on a particular parcel could be rejected by the BLM providing they did not offer a minimum compensation level established by the BLM.

   l) All present leases on which there has been no activity for the past ten years should be subject to this competitive bidding procedure at the time of their expiration.

We believe some policies such as those enumerated above are necessary to eliminate speculation in mineral leases, foster the orderly development of the soda industry, control the unreasonable pricing of private property leases, and preserve healthy competition in an area which should become the dominant source of soda ash in the world market.

Very truly yours,

M. E. Clark

Melvin E. Clark

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Defenders OF WILDLIFE

October 26, 1981

COMMENTS OF DEFENDERS OF WILDLIFE ON THE DRAFT ENVIRONMENTAL ASSESSMENT OF SODIUM MINERAL DEVELOPMENT IN ROCK SPRINGS DISTRICT, WYOMING:

If we sweep generalities aside and focus on known facts concerning ecosystem impacts from trona mining it becomes apparent that no one knows very much.

We can measure acres of vegetation lost to plant sites and utility corridors, define ancial impacts, calculate economic benefits from the tax-base and employment market provided by this industry, and even project economic benefits far into the future since southwest Wyoming is blessed with a considerable amount of trona and the demand for this product is relatively stable.

However, very little has been learned about long-range impacts on vegetative communities from wind-blown trona dust and stack emissions. We have no studies to determine hydrofluoride concentrations although this chemical is recognized as being very toxic to plant life. Although fluorine is found in rather high concentrations throughout the trona area, studies have not determined if emissions can causes concentrations of flurine that could pose health hazards to city water supplies during periods of run-off. Further, ability of soil to maintain even a nominal ground cover after being subjected to years of sodium accumulation has not been assessed.

Indications of things-to-come can be seen in the big-sage and grassland communities near trona stockpiles and downwind from plant stacks. These plants have been reduced to rotted stumps and little hummocks that used to sprout grass. Shadscale seems to thrive in these areas, but studies indicate that even these plants are unable to reproduce, probably due to the ceasanting of the soil by soda-ash.

So far, acreage of severe impacts or destruction of vegetation is small compared with the whole. However, year-by-year accumulation of soda-ash over wide areas will continue, even increase substantially with new development. If plant communities are impacted, as it appears they will be, not only will habitat for wildlife and livestock be diminished, but erosion resulting from loss of ground cover could literally silt-in the Green River and hasten eutrophication of the Flaming Gorge.

We concur with the EA monitoring plan as outlined on pages 123-24. In addition, we believe a fluorine monitor should be installed in the Green River, above the city water supply intake. Installation of this device would seem logical since there are concerns regarding amounts of fluorine in the [illegible]

We believe that surge-ponds should be a required item for any plant drawing water from the Green or Blacks Fork Rivers. During periods of low-

DEFENDERS OF WILDLIFE

1244 NINETEENTH STREET, NW • WASHINGTON, DC 20036 • (202) 659-9510

flow, use of surge-pond water rather than further drawing down the rivers would greatly benefit fisheries, aquatics, and even Flaming Gorge.

We agree that S number of acres utilized for plant sites and utility corridors translates to less forage for wildlife. However, cumulative effects that stem from many roads, such disturbance, many people, and unknown impacts from stack-emission fall-out will undoubtedly be of greater significance than mere number of acres occupied by trona development.

The EA's forecast that only a few antelope, deer, etc. will be lost to increased production of trona is rather unrealistic. The numbers will prove to be much higher.

To offset some of these impacts we believe cost/benefit derived from improving existing habitat, improving and restoring riparian areas, developing water sources and fencing these areas to create mini-riparian zones, would be a wise investment in the future of Green River Basin wildlife.

We can mitigate impacts on wildlife till the cows come home, but each time we mitigate we loose a little. And a few years down the road we will have lost a lot. We must take what is left and make it better than it was before if we intend to maintain our great wildlife communities and our commitment to wildlife.

We believe good-will and good-press would greatly benefit the trona companies if they would help to fund long-range wildlife monitoring studies conducted by Wyoming Game and Fish Department, Bureau of Land Management, and U.S. Fish and Wildlife Service. Dollars required for these studies are presently in short supply among the various agencies, and they may become even shorter. And yet, without monitoring various species of wildlife we can only play the game of educated guess'e, which are often not accurate.

Given the date the writers had to work with, this EA is well done. It is the unknowns that greatly concern us. We reiterate; monitoring of air, water, soil, vegetation and wildlife should be a priority.

Thank you for the opportunity to comment on this subject. Certainly, the challenge to develop, and yet to preserve, is a great one.

Dick Randall
North central representative
Defenders of Wildlife
Box 507
Rock Springs, Wyoming 82901

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United States Department of the Interior

GEOLOGICAL SURVEY
Conservation Division
100 East "B" Street, Room 4130
Casper, Wyoming 82601

NOV 25 1981

Memorandum

To: Wyoming State Director, Bureau of Land Management, P.O. Box 1828 Cheyenne, Wyoming 82001

From: Conservation Manager, North Central Region

Subject: Draft Environmental Assessment, Sodium Mineral Development, Rock Springs District, Wyoming

We have reviewed the subject document and offer the following comments for your consideration.

The draft assessment adequately addresses the anticipated impacts associated with the expansion of sodium leasing and development activities with one exception. On page 44, Surface Water, no information is provided on the presence or absence of surface springs or seeps. If springs or seeps are present within and/or adjacent to the area covered by the draft assessment, this information should be included in this section of the report. In addition, because free surface water is very important to terrestrial wildlife in arid areas, an impact assessment should be provided in Chapter III, Environmental Consequences.

Dwayne E. Hull

GLOSSARY

References consulted in the preparation of the definitions include Bureau of Land Management manuals and publications; Dictionary of Geological Terms (American Geological Institute 1976); Resource Conservation Glossary (Soil Conservation Society of America 1976); Common Environmental Terms (Environmental Protection Agency 1973); and several professional publications on sodium.

ACRE-FOOT. A unit of measurement equal to the quantity of water required to cover 1 acre to the depth of 1 foot; a volume equal to 43,560 cubic feet.

ADIABATIC LAPSE RATE. The rate at which the temperature of an ascending or descending air mass is changed by the process of expansion or compression; generally about 1.6°F. per 300 feet.

ALLUVIAL SEDIMENT. Clay, sand, gravel, silt, or other rock or mineral materials that have been transported and deposited by flowing water.

ANCILLARY FACILITIES. Structures outside the actual plant which are necessary to support the major functions of the processing plant; e.g., well gathering lines, powerlines, pipelines, etc.

ANDESITIC TUFFS. Rocks composed of fine particles of volcanic ash and volcanic dust; andesite is volcanic in origin, and it is composed of oligoclase ($KAlSi_3O_8$) or andesine feldspar.

ANIMAL UNIT MONTH (AUM). The forage required to support one cow and calf for one month (1,800 pounds on a 50 percent utilization basis); an AUM also is considered the forage required to support one horse, five sheep, five deer, one elk, one moose, or about 15 pronghorn.

CALCINED. Heated to a high temperature, but below the melting or fusing point to cause loss of moisture and volatile matter, reduction, or oxidation.

CHECKERBOARD LAND PATTERN. Alternating sections of Federal lands with sections owned by private landowners or the State for 20 miles on either side of the Union Pacific Railroad in southwestern Wyoming. This pattern appears as a checkerboard on maps using different colors for different land status.

CRUCIAL HABITAT. A portion of the habitat of a wildlife species that, if destroyed or adversely modified, could result in the population being listed as threatened or endangered pursuant to section 4 of the Endangered Species Act, or in some category implying endangerment by a state agency or legislature. Examples of crucial habitat include nesting areas, broodrearing areas, winter ranges, migration routes, etc.

CULTURAL SITE. The physical location of past human activities or events, varying in size and range from a single cultural resource object to a cluster of cultural resource structures with associated objects and features. A site may consist of secondarily deposited cultural resource remains.

DENDRITIC DRAINAGE PATTERN. A drainage system which, when viewed from a distance, resembles the branching of a tree.

DESERT PAVEMENT. A crust of pebbles or larger stones that accumulate when water or wind action removes the finer dust and sand; the pebble material forms a mosiac-patterned surface that protects the finer material beneath the surface from erosion. Also formed by upward movement of gravel or coarser materials from underlying sediments.

EPHEMERAL STREAMS. Streams that flow only briefly during and after rainfall in the immediate area.

EUTROPHICATION. The normally slow process by which a lake evolves into a bog or marsh, then into a terrestrial area. During this process, the lake becomes so rich in dissolved nutrients, such as nitrogen and phosphorus compounds, that algae and other microscopic plant life overpopulate the lake, "choking" it, and causing it to dry up.

FLUORAPATITES. Calcium phosphate minerals, $Ca_5(PO4)_3F$ which are common apatites of igneous rocks.

FOREGROUND-MIDDLEGROUND. The area visible from a travel route, use area, or other observer position to a distance of 3 to 5 miles. The outer boundary of this zone is defined as the point where the texture and form of individual plants are no longer apparent in the landscape, and vegetation appears only in patterns or outline.

GUZZLER. A device for preserving water for the use of game birds in arid regions.

HALITE. The natural solid form of salt (NaCl). It is colorless to white when pure, and it comprises 95 to 99 percent of rock salt.

HARASSMENT. Increased human activity in an area which, intentionally or unintentionally, disturbs and prompts livestock and/or wildlife to change their normal use of the range. Noise generated by a bulldozer, visual contact with humans, increased vehicular use along seldom-used roads, and increased poaching or hunting are examples of what constitutes harassment for the purposes of this analysis.

HI-VOL. A hi-volume sampler, which is a device used in the measurement and analysis of suspended particulate pollution.

HORIZON. A layer of soil or soil material approximately parallel to the land surface and differing from adjacent, genetically related layers in physical, chemical, and biological properties or characteristics such as color, structure, texture, kinds and numbers of organisms present, the degree of acidity or alkalinity, etc.

INTERMITTENT STREAMS. Streams that flow only when they receive ground-water discharge or long, continual runoff from melting snow or other surface and shallow subsurface sources.

KNOWN SODIUM LEASING AREA (KSLA). The area determined by the U.S. Geological Survey to include mineable trona beds, using conventional underground methods. The area includes trona beds that are four feet or more in thickness and relatively halite-free over all or part of the beds that exceed four feet in thickness; no overburden or additional criteria have been established. Originally established on March 4, 1954, and amended several times since (the last amendment being April 27, 1978), the area contains approximately 692,127 acres; including an area of 1.5 square miles in the north-central portion which was added for administrative purposes.

LACUSTRINE SEDIMENT. Material deposited in the bottom of lakes and later exposed either by a lowering of the water level or by an elevation of the land.

LEK. The site of sage grouse courtship.

LIMITED SURFACE OCCUPANCY. Areas where plant site development and structures could not occur or would be limited to prevent or reduce conflicts with other resources. Developments with limited impacts, such as roads, railroads, powerlines, pipelines, communication lines, ponds, and low-visibility structures may, in most cases, meet limited surface occupancy criteria.

MONOHYDRATE PROCESS. A method used to produce dense soda ash from trona. The trona ore is calcined into soda ash, then dissolved. The soda ash solution is passed through classifiers and filters to remove all insoluble matter, then concentrated by evaporators. The soda ash precipitates as sodium carbonate monohydrate ($NaCO_3.H_2O$) crystals, and then separated from the remaining solution by centrifugation. Water is removed from the crystals by a second calcination.

NONATTAINMENT AREA. An area which is shown by monitored data, or by calculations using air quality modeling, to exceed any National Ambient Air Quality Standard for any air pollutant.

OXBOWS. A crescent-shaped lake formed by a bend in a river (meander loop) that has become separated from the mainstream by a change in the course of the river.

PALUDAL SEDIMENTS. Material that was deposited in the bottom of a swamp or marsh.

PHYSIOGRAPHIC PROVINCE. An extensive area of the landscape, normally encompassing many hundreds of square miles, that portrays similar qualities of soil, rock, slope, and vegetation of the same geomorphic origin.

PLAYA. A usually dry and nearly level lake plain that occupies the lowest parts of closed depressions, such as those occurring on intermontane basin floors.

RIPARIAN. Situated on or pertaining to the bank of a river, stream, or other body of water. Normally used in referring to the plants of all types that grow rooted in the water table or in streams, ponds, springs, etc.

SESQUICARBONATE PROCESS. A method used to produce light or intermediate density soda ash. The trona ore is dissolved in the natural state, and insoluble impurities are removed by clarification and filtration before pure sodium sesquicarbonate is crystallized. The crystals are converted to soda ash by calcination.

SHALLOW SYNCLINE. A fold in sedimentary rock strata in which the opposing ends of the beds dip downward and toward the fold's axial plane.

SODIUM DEVELOPMENT AREA. That portion of the Rock Springs District where development of sodium minerals is most likely to occur; i.e., the trona deposition area and the sodium carbonate brine area.

SODIUM MINERALS. Naturally occurring organic substances which provide sodium chemical compounds such as sodium carbonate, sodium bicarbonate, and sodium sulfate. The three commonly recognized sodium minerals are trona, mirabilite, and thenardite (Bates 1969). This EA primarily deals with trona, the major natural source for soda ash; the other minerals are sources for sodium sulfate.

SOIL ERODIBILITY. The relative ease with which one soil erodes under specified conditions as compared with other soils under the same conditions.

SOIL GROUPS. A mapping unit in which two or more defined taxonomic units occurring together in a characteristic pattern are combined because the scale of the map or the purpose for which it is being made does not require delineation of the individual soils. Also known as SOIL ASSOCIATIONS.

SOIL SERIES. The basic unit of soil classification in which the soils are essentially alike in all but one of the major profile characteristics.

SOLVAY PROCESS. A process for making synthetic process from common salt (NaCl). Purified brine is saturated with ammonia gas, then carbon dioxide gas is passed through the solution to form a sodium bicarbonate precipitate. The precipitate is calcined into soda ash. Named after Ernest Solvay, a Belgian chemical engineer who developed the process more than 100 years ago.

SURFACE OCCUPANCY. Refers to plant site development and structures including, but not limited to, the processing plant, steam plant, ore and coal stockpiles, loadout stations, storage tanks, office and storage buildings, tailings ponds, containment ponds, etc. It does not refer to facilities such as access roads, railroads, powerlines, pipelines, communication lines and sites, mine shaft entrance facilities, ventilation shafts, hoist houses, sewage ponds, sanitary landfills, etc.

SWEETENING PLANT. A natural gas process plant that removes hydrogen sulfide from "sour gas", thus converting it to "sweet gas".

TONS. Short ton as used in this document is equal to 2,000 pounds. A long ton is 2,240 pounds and a metric ton is 1,000 kilograms, or 2,204.6 pounds.

TRONA. A naturally occurring sodium sesquicarbonate ($Na_2CO3.NaHCO_3.2H_20$) that was formed in ancient saline lakes. It is generally honey or light brown in color, depending upon the impurities present in the mineral.

VEGETATION TYPE. A term used to differentiate the plant communities in an area; the type generally refers to and is named after the plant species or various combinations of species that dominate or appear to dominate a particular site.

VISITOR-DAY. A day in which the visitor-hours contained therein have been spent by a person in any activity except those which are part of or incidental to the pursuit of a gainful occupation. Twelve visitor-hours aggregated by one or more persons constitute a visitor-day.

VISUAL CONTRAST RATINGS. A method for measuring the visibility of a change or modification in any landscape feature. Contrast ratings are determined by "feature"; that is, each component part of a landscape which could be affected by change: land and water, vegetation, and the addition of structures. Changes to the existing landscape character are broken down in each feature as changes to "form," "line," "color," and "texture." Cf BLM Manual 6320.31 for further details.

VISUAL RESOURCE MANAGEMENT CLASSES. The degree of visual change that is acceptable within the characteristic landscape which is based upon the physical and sociological characteristics of a given homogeneous area. Class I provides primarily for natural ecological changes; any contrast created within the characteristic landscape must not attract attention. Class II provides for management activity, but changes in any of the basic elements (form, line, color, and texture) should not create contrasts that attract attention. Class III indicates contrasts to the basic elements caused by management activity may be evident and begin to attract attention in the characteristic landscape, although such changes should remain subordinate to the existing landscape. Class IV contrasts attract attention and may be a dominant feature in the landscape in terms of scale, although the change should repeat the basic elements inherent in the characteristic landscape. Class V applies to areas that have been disturbed to the point where the contrast is inharmonious with the characteristic landscape, and rehabilitation is necessary to bring the area back into character with the surrounding landscape.

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